

**Lake Huron Fisheries Assessment Unit
Report 1-92**

**Status and Outlook for the
Major Commercial Fish Species
of Lake Huron, 1992**



Ontario

**Ministry of
Natural
Resources**

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INTRODUCTION

The commercial harvesting of fish from Lake Huron is controlled through area specific allocations and licensee specific quotas which are subject to annual review and revision. This document, in both its timing and content, is intended as a companion to that process.

It traces annual harvests over a 12 year period (1980-1991) and relates those harvests to the allocations for those years that quota-control has been in place. Likewise, it traces the relative abundance of the primary commercial species through statistics derived from the commercial fishing reports. The character of the harvest and to a lesser extent of the populations in the lake is made known through age and size statistics which come from on-board sampling of representative commercial catches. Together, these pieces of information describe the state of the fishery in the previous year and give insight into the supply of catchable fish being carried over into the current year. This is still only part of the picture as the total supply of fish is dependent as well on the number of fish which will grow into the catchable-size range ("recruits") during 1992. A tracking of year to year changes in reproduction ("year class strength") has been undertaken through independent fishing and those results are presented, together with comments on the likely impact of the recruiting year classes. Finally, forecasts of changes in the supply of commercial fish are made on the strength the composite picture developed.

The document is also intended as an atlas of summary statistics to facilitate further analyses by management and research staff, particularly analyses which fall within our conceptual management model but go beyond our current time allowance. With this purpose in mind, much of the material is presented in both graphical and tabular form, many of the tables being contained within an appendix.

The fundamental unit of organization within the report is the management area (see Figure 1 for areas). Each such section opens with a table presenting 1991 statistics for allocation, quota, harvest and landed value, by species. This is a departure from our 1991 report in which we reported the sum of the quotas issued as the allocation. Allocation is now used to describe the commercial fishing base for an area, it is the sum of the base quotas on all commercial licences, including those not issued. Quota refers to the sum of the commercial fish quotas on all licences issued.

Beyond this there are species divisions wherein measures of harvest, fishing effort, and abundance (CUE = catch-per-unit-effort) are given in graphical form and the age composition of catches, if known, is tabulated. Should a management area contain more than one assessment area, there may be a further breakdown of statistics by these smaller subdivisions.

Index fishing is carried out at few locations within any basin (Figure 1). Estimates of pre-recruit abundance derived from these separate projects appear within the respective management area sections of the document. Where we extrapolate recruitment forecasts from these to other management areas there is cross-referencing to allow the recruitment indices to be readily found.

Discarding of portions of catches is a practice which has taken on new meaning since the introduction of quotas. At one time it was largely confined to the usually small part of the catch which failed to meet quality standards. Beginning in about 1985, discarding came to include varying proportions of the catch which in terms of market acceptance were of lower grade. The increasing amounts of fish involved have biased fishery statistics, especially for chub where the practice is most prevalent. For the first time, an effort is being made to correct for this bias, as will be seen in some graphs where the retained and discarded portions of the catch are separately shown.

Reports submitted by commercial fishermen have long been an important source of stock assessment data. In recent years there have been two major changes in reporting which have the potential to increase the quality of assessment information. In 1989, a new form and reporting procedures were introduced in southern Lake Huron which allow reporting of catches daily as they are being landed. This new system seems to have improved the quality of harvest and effort reporting, however, the changes in the reporting of fishing effort could affect CUE, an indicator of abundance. A second major change occurred in 1991 as commercial fishermen began to report the weight of fish killed in the gear and then discarded. Although this gave assessment biologists a better insight into total harvest, it necessitated a change in the way in which commercial landings are described. In this report we use the following two terms to describe commercial landings: "harvest" which refers to the weight of fish caught that are killed, landed and sold; and "catch" which refers to the total weight of fish killed; the "harvest" plus the reported discards.

In this report the term "abundance" is used in a somewhat narrow sense to mean the abundance of harvestable fish in the population. In other words, it equates to the supply of fish perceived by fishermen.

INTRODUCTION

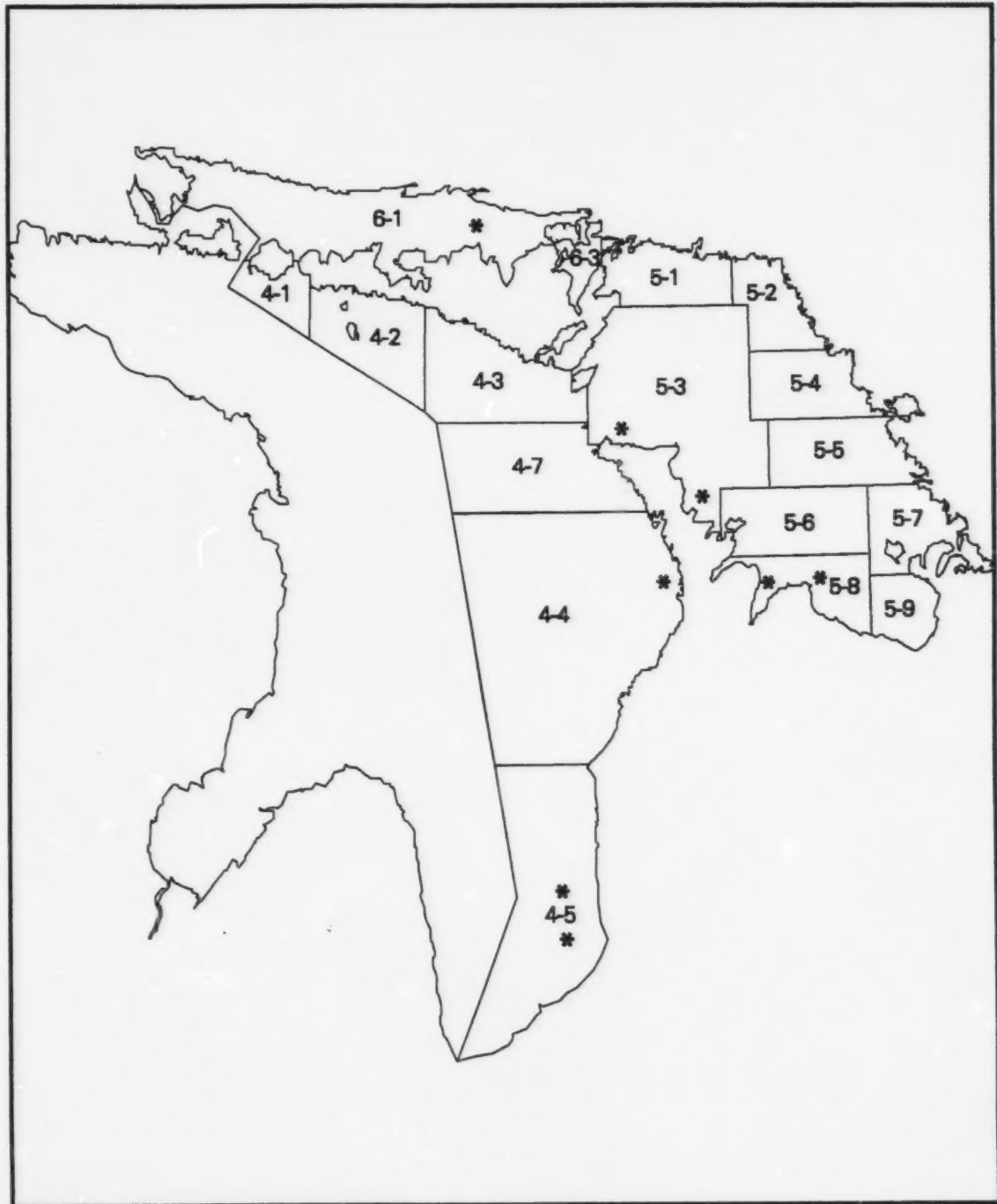


Figure 1. Lake Huron management areas. Index netting sites indicated by an asterisk.

INTRODUCTION

LAKE HURON



GENERAL

- The total commercial fish allocation for all fish species under quota control was 3,940,586 kg (Table 1).
- Total quotas issued on commercial fish licences amounted to 3,907,562 kg.
- Harvest of all fish species under quota control was 2,771,086 kg. Value of the harvest of species under quota control increased to \$6,911,062.
- Harvest and value of all fish species sold was 2,874,924 kg and \$6,992,596, respectively (Table 2). An additional 134,768 kgs of species of no commercial value were reported discarded.

Table 1. Allocation, quota, harvest and percent quota taken by quota species for all three basins of Lake Huron, 1991.

Species	Allocation (kgs)	Quota (kg ^e)	Harvest (kgs)	% Quota Taken
Channel Catfish	66352	66352	22588	34.0
Chub	995708	979035	537205	54.9
Lake Sturgeon	11121	11121	5335	48.0
Lake Trout	72523	67977	44121	64.9
Lake Whitefish	2024312	2019555	1717696	85.1
Northern Pike	22087	22087	4790	21.7
Pink Salmon	146542	146451	3000	2.0
Walleye	157054	158778	141141	88.9
Yellow Perch	444887	436206	295210	67.7
Total	3940586	3907562	2771086	

Table 2. Value, harvest and catch by species for all three basins of Lake Huron, 1991.

Species	Value (\$)	Harvest (kgs)	Catch (kgs)
Alewife	0	0	84
American Eel	45	22	22
Bigmouth Buffalo	23	34	34
Black Crappie	171	104	104
Bullhead	178	190	218
Burbot	53	492	14727
Caviar	277	76	76
Channel Catfish	23958	22588	22706
Chinook Salmon	0	0	549
Chub	997552	537205	537233
Common Carp	15583	16156	16701
Freshwater Drum	23024	30820	30820
Gizzard Shad	439	479	933
Lake Herring	17736	22285	22419
Lake Sturgeon	25483	5335	5344
Lake Trout	116892	44121	44991

... continued

Table 2 (con't). Value, harvest and catch by species for all three basins of Lake Huron, 1991.

Species	Value (\$)	Harvest (kgs)	Catch (kgs)
Lake Whitefish	3829666	1717696	1717993
Northern Pike	8908	4790	4849
Pacific Salmon	0	0	760
Pink Salmon	3253	3000	3945
Rainbow Smelt	3829	7895	7967
Rainbow Trout	0	0	39
Redfin	3911	5312	5312
Rock Bass	189	171	737
Round Whitefish	12312	17231	17580
Stonecat	0	0	5
Suckers	75	0	73060
Walleye	599747	141141	141238
White Bass	3039	2179	2181
White Perch	558	392	392
Yellow Perch	1305695	295210	295255
Discarded (mixed)	0	0	51584
Total	6992596	2874924	3019858

LAKE HURON BASIN



GENERAL

- The total commercial fish allocation for all fish species under quota control increased 10% to 2,766,570 kgs (Table 3).
- Quota issued on commercial fish licences equalled the commercial fish allocation.
- Harvest of all fish species under quota control increased 12% to 2,167,150 kgs. Value of the harvest of species under quota control decreased 1% to \$5,547,650.
- Harvest and value of all fish species sold was 2,218,646 kgs and \$5,583,592, respectively (Table 4). An additional 21,681 kgs of species of no commercial value were reported discarded.

Table 3. Allocation, quota, harvest and percent quota taken by quota species for Lake Huron basin, 1991.

Species	Allocation (kgs)	Quota (kgs)	Harvest (kgs)	% Quota Taken
Channel Catfish	55437	55437	22319	40.3
Chub	602943	602943	315214	52.3
Lake Sturgeon	4491	4491	3479	77.5
Lake Trout	44221	44221	22718	51.4
Lake Whitefish	1614362	1614362	1440977	89.3
Northern Pike	1901	1901	246	12.9
Pink Salmon	9859	9859	231	2.3
Walleye	127977	127977	123835	96.8
Yellow Perch	305379	305379	238131	78.0
Total	2766570	2766570	2167150	

Table 4. Value, harvest and catch by species for Lake Huron basin, 1991.

Species	Value (\$)	Harvest (kgs)	Catch (kgs)
Alewife	0	84	84
American Eel	45	22	22
Bigmouth Buffalo	23	34	34
Black Crappie	1	1	1
Brown Bullhead	0	30	30
Burbot	0	184	4113
Caviar	13	11	11
Channel Catfish	23714	22319	22320
Chinook Salmon	0	0	177
Chub	601225	315214	315214
Common Carp	3384	4529	4529
Freshwater Drum	23024	30820	30820
Gizzard Shad	439	479	933
Lake Herring	144	246	257

... continued

Table 4 (con't). Value, harvest and catch by species for Lake Huron basin, 1991.

Species	Value (\$)	Harvest (kgs)	Catch (kgs)
Lake Sturgeon	18412	3479	3479
Lake Trout	51245	22718	23019
Lake Whitefish	3243607	1440977	1440977
Northern Pike	401	246	246
Pacific Salmon	4	5	438
Pink Salmon	302	231	240
Rainbow Smelt	8	15	72
Rainbow Trout	0	0	9
Redfin	3911	5312	5312
Round Whitefish	1349	2048	2048
Shortjaw Cisco	0	1029	1029
Suckers	0	4085	4694
Walleye	541135	123835	123835
White Bass	3039	2179	2181
White Perch	558	392	392
Yellow Perch	1067609	238131	238131
Discarded (mixed)	0	0	15681
Total	5583592	2218646	2240328

MANAGEMENT AREA 4-1**GENERAL**

- The total commercial fish allocation for all fish species under quota control remained constant at 100,442 kgs (Table 5).
- Quota issued on commercial fish licences equalled the commercial fish allocation.
- Harvest of all fish species under quota control decreased 63% to 19,265 kgs. Lake whitefish and chub, the primary commercial fish species in this management area, accounted for the bulk of the drop in harvest. Value of the harvest of species under quota control decreased 57 % to \$51,837.
- Harvest and value of all fish species sold was 19,570 kgs and \$52,073, respectively (Table 6). An additional 559 kgs of species of no commercial value were reported discarded.

Table 5. Allocation, quota, harvest and percent quota taken by quota species for management area 4-1, 1991.

Species	Allocation (kgs)	Quota (kgs)	Harvest (kgs)	% Quota Taken
Channel Catfish	1287	1287	40	3.1
Chub	22833	22833	3292	14.4
Lake Sturgeon	203	203	0	0.0
Lake Trout	1572	1572	2194	139.6
Lake Whitefish	71932	71932	13342	18.5
Northern Pike	0	0	0	0.0
Pink Salmon	2046	2046	149	7.3
Walleye	519	519	248	47.8
Yellow Perch	50	50	0	0.0
Total	100442	100442	19265	

Table 6. Value, harvest and catch by species for management area 4-1, 1991.

Species	Value (\$)	Harvest (kgs)	Catch (kgs)
Burbot	0	0	136
Channel Catfish	40	40	40
Chinook Salmon	0	0	7
Chub	9039	3292	3292
Common Carp	146	194	194
Lake Herring	2	3	3
Lake Trout	6684	2194	2217
Lake Whitefish	34928	13342	13342
Pink Salmon	168	149	149
Round Whitefish	88	107	107
Suckers	0	0	171
Walleye	978	248	248
Discarded (mixed)	0	0	223
Total	52073	19570	20129

LAKE WHITEFISH

- The allocation remained at 71,932 kgs. Quota issued equalled the allocation.
- The harvest dropped 53% to 13,342 kgs, 18% of the allocation (Figure 2).
- Effort dropped 35% to 252 kms (Figure 3).
- CUE decreased 27% to 53 kgs/km (Figure 4).
- Abundance unexpectedly declined. Preliminary onboard catch sampling indicated that the contribution of age 4 and 5 fish was less than predicted.
- The failure of the 1986 and 1987 year-classes to contribute significantly to the fishery as in other areas suggests that the decline in the stock will continue in 1992. CUE has declined approximately 40% since 1987.

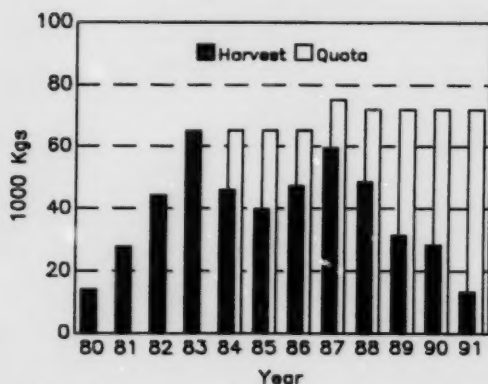


Figure 2. Lake whitefish harvest and quota (kgs) for management area 4-1.

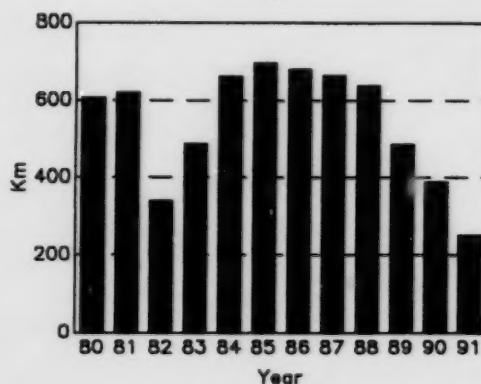


Figure 3. Lake whitefish annual gill net effort (km) for management area 4-1.

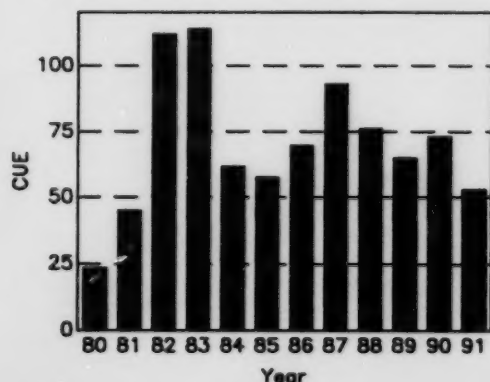


Figure 4. Lake whitefish annual gill net CUEs (kgs/km) for management area 4-1.

CHUB

- Allocation remained at 22,833 kgs. Quota issued equalled the allocation.
- Harvest decreased 85% to 3,292 kgs, 14% of the allocation (Figure 5).
- Effort dropped 86% to 37 kms (Figure 6).
- CUE increased 9% to 89 kgs/km (Figure 7).
- Abundance did remain high as predicted. Abundance will begin to decline in 1992 as the weak 1985 through 1987 year-classes replace those strong year-classes currently in the fishery.

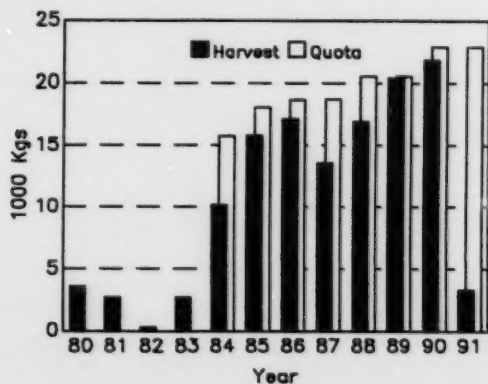


Figure 5. Chub harvest and quota (kgs) for management area 4-1.

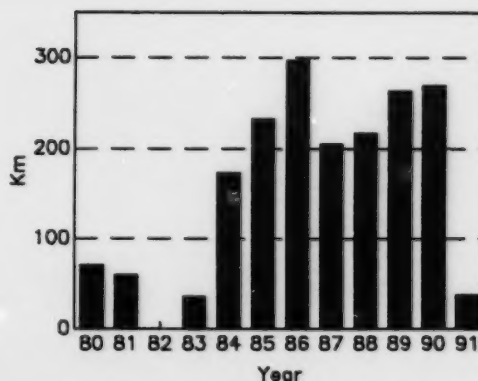


Figure 6. Chub annual gill net effort (km) for management area 4-1.

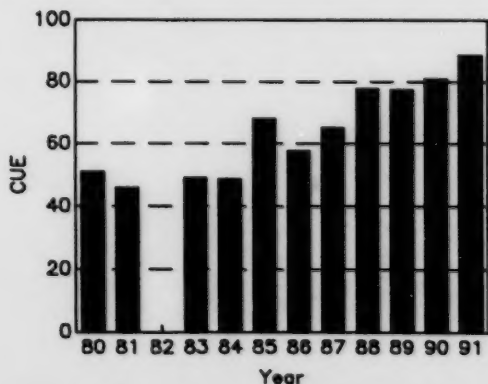


Figure 7. Chub annual gill net CUEs (kgs/km) for management area 4-1.

MANAGEMENT AREA 4-2**GENERAL**

- The total commercial fish allocation for all fish species under quota control remained essentially unchanged at 204,435 kgs (Table 7).
- Quota issued on commercial fish licences equalled the commercial fish allocation.
- Harvest of all fish species under quota control increased 22% to 131,958 kgs. Lake whitefish, one of the primary commercial fish species in this management area, accounted for the bulk of the increase in harvest. Value of the harvest of species under quota control increased 15% to \$309,842.
- Harvest and value of all fish species sold was 133,675 kgs and \$310,469, respectively (Table 8). An additional 9,791 kgs of species of no commercial value were reported discarded.

Table 7. Allocation, quota, harvest and percent quota taken by quota species for management area 4-2, 1991.

Species	Allocation (kgs)	Quota (kgs)	Harvest (kgs)	% Quota Taken
Channel Catfish	3636	3636	954	26.2
Chub	43582	43582	40771	93.6
Lake Sturgeon	357	357	102	28.6
Lake Trout	1356	1356	1661	122.5
Lake Whitefish	153161	153161	88301	57.7
Northern Pike	129	129	3	2.3
Pink Salmon	1591	1591	46	2.9
Walleye	373	373	120	32.2
Yellow Perch	250	250	0	0.0
Total	204435	204435	131958	

Table 8. Value, harvest and catch by species for management area 4-2, 1991.

Species	Value (\$)	Harvest (kgs)	Catch (kgs)
Channel Catfish	671	954	955
Chinook Salmon	0	0	163
Chub	110686	40771	40771
Coho Salmon	0	0	0
Common Carp	385	537	537
Freshwater Drum	38	55	55
Lake Herring	56	100	100
Lake Sturgeon	711	102	102
Lake Trout	5344	1661	1710
Lake Whitefish	191951	88301	88301
Northern Pike	0	3	3
Pacific Salmon	0	3	375
Pink Salmon	90	46	55
Round Whitefish	148	1029	1029
Walleye	389	120	120
Discarded (mixed)	0	0	9190
Total	310469	133675	143466

LAKE WHITEFISH

- The allocation remained at 153,161 kgs. Quota issued equalled the allocation.
- The harvest increased 44% to 88,301 kgs, 58% of the allocation (Figure 8). The gill net fishery accounted for 72% of the harvest with the remainder coming out of the trap net fishery (Figure 9).
- Gill net effort increased 44% to 977 kms while trap net effort stayed essentially unchanged at 202 nets (Figure 10).
- CUE of harvestable fish in the gill and trap net fisheries increased 3% (to 65 kgs/km) and 34% (to 122 kgs/net), respectively (Figure 11).
- The number of recruiting age 4 fish increased as predicted but failed to offset weak older year-classes (ages 6+) (Tables 9,10,11). The continued decline in the contribution of ages 6+ fish is unexpected considering the recent downsizing of the fishery. The good showing of undersize age 3 fish in the trap net fishery (Table 11) is consistent with the predicted strength of the 1988 year-class (Figure 25, page 32).
- Abundance did not increase as much as expected. Although age 4 fish did contribute significantly to the fishery as predicted, the contribution of age 6 and up fish was lower than expected (Tables 12,13,14).
- Abundance should increase in 1992 with the entry of the strong 1988 year-class as age 4 fish (Table 14); however, if older fish continue to inexplicably disappear from the fishery, abundance will remain at or below current levels. This uncertainty precludes abundance forecasting for 1993.

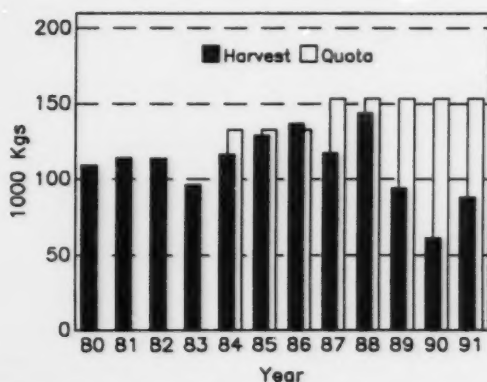


Figure 8. Lake whitefish harvest and quota (kgs) for management area 4-2.

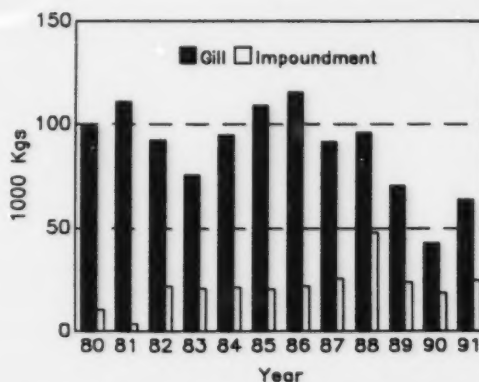


Figure 9. Lake whitefish harvest (kgs) for management area 4-2.

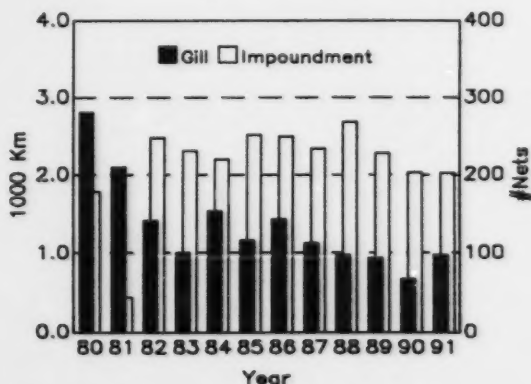


Figure 10. Annual effort for lake whitefish in management area 4-2.

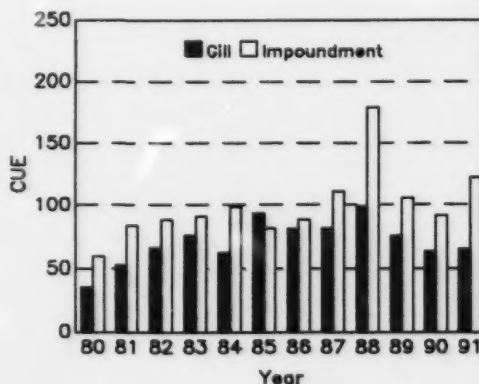


Figure 11. Lake whitefish annual CUEs for management area 4-2.

Table 9. Age-class composition of lake whitefish harvested in gill nets in management area 4-2.

AGE	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
1	0	0	0	0		0	0	0	0	0	0	0
2	0	0	0	0		0	0	0	0	0	0	0
3	6814	3549	159	0		541	981	0	0	1546	1027	453
4	31813	67666	14508	5638	N	8423	39964	19443	5367	7533	12318	28230
5	21979	15416	45633	35376	O	61822	41661	33378	53462	17481	8100	13596
6	4444	3004	3647	12649		12463	11875	17924	15499	19117	6061	2358
7	2295	464	581	582	D	2405	1149	6460	1989	3220	3714	1057
8	1515	605	581	0	A	861	215	801	1574	1131	1040	1508
9	0	304	843	0	T	71	237	83	0	407	212	223
10	133	54	0	0	A	0	0	0	348	206	352	122
11	0	197	0	0		143	0	0	0	0	24	122
12	133	54	0	0		0	0	0	97	0	0	0
13	0	0	0	0		0	0	0	0	0	0	0
>13	133	0	0	0		0	0	0	0	0	0	0

Table 10. Age-class composition of harvested lake whitefish caught in trap nets in management area 4-2.

AGE	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
1	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	35	0	0
3	99	93	102	783	884	359	472	1097	2921	2163
4	7487	7698	5485	4023	8917	12123	9505	2993	6486	16313
5	7280	7154	10066	8759	7617	7402	22245	3952	2706	3257
6	733	1471	3221	2544	2930	2703	5289	5176	1734	486
7	66	53	432	278	354	946	2074	2053	1230	236
8	78	0	20	247	67	208	575	505	540	33
9	117	111	20	0	0	26	0	143	125	119
10	115	35	20	0	41	44	0	0	23	33
11	0	146	0	0	0	0	177	26	27	0
12	0	18	0	0	0	26	50	0	0	0
13	0	0	0	43	0	0	0	0	0	0
>13	49	18	0	0	0	0	0	0	0	0

Table 11. Age-class composition of harvested and released lake whitefish caught in impoundment nets in management area 4-2.

AGE	1986	1987	1988	1989	1990	1991
1	70		514	0	48	39
2	1434		7749	1468	4619	2650
3	19204		10652	3134	23624	16421
4	16359	N	14774	3346	8616	23119
5	8471	O	22729	4008	2706	3283
6	3064		5471	5176	1734	499
7	354	D	2074	2053	1230	236
8	67	A	575	505	540	33
9	0	T	0	143	125	119
10	41	A	0	0	23	33
11	0		177	26	27	0
12	0		50	0	0	0
13	0		0	0	0	0
>13	0		0	0	0	0

Table 12. CUE-at-age (number/km) for lake whitefish harvested in gill nets in management area 4-2.

AGE	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
1	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	2.43	1.70	0.11	0.00		0.47	0.69	0.00	0.00	1.65	1.52	0.46
4	11.35	32.40	10.33	5.62	N	7.24	28.03	17.30	5.51	8.04	18.17	28.90
5	7.84	7.38	32.48	35.25	O	53.17	29.22	29.70	54.84	18.65	11.95	13.92
6	1.58	1.44	2.60	12.60		10.72	8.33	15.95	15.90	20.39	8.94	2.41
7	0.82	0.22	0.41	0.58	D	2.07	0.81	5.75	2.04	3.43	5.48	1.08
8	0.54	0.29	0.41	0.00	A	0.74	0.15	0.71	1.61	1.21	1.53	1.54
9	0.00	0.15	0.60	0.00	T	0.06	0.17	0.07	0.00	0.43	0.31	0.23
10	0.05	0.03	0.00	0.00	A	0.00	0.00	0.00	0.36	0.22	0.52	0.13
11	0.00	0.09	0.00	0.00		0.12	0.00	0.00	0.00	0.00	0.04	0.13
12	0.05	0.03	0.00	0.00		0.00	0.00	0.00	0.10	0.00	0.00	0.00
13	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00
>13	0.05	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00

Table 13. CUE-at-age (#/net) for lake whitefish harvested in impoundment nets in management area 4-2.

AGE	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.15	0.00	0.00
3	0.40	0.40	0.47	3.12	3.55	1.54	1.76	4.81	14.39	10.71
4	30.31	33.32	25.05	16.03	35.81	52.03	35.47	13.13	31.95	80.76
5	29.47	30.97	45.96	34.90	30.59	31.77	83.00	17.33	13.33	16.12
6	2.97	6.37	14.71	10.14	11.77	11.60	19.74	22.70	8.54	2.41
7	0.27	0.23	1.97	1.11	1.42	4.06	7.74	9.00	6.06	1.17
8	0.32	0.00	0.09	0.98	0.27	0.89	2.15	2.21	2.66	0.16
9	0.47	0.48	0.09	0.00	0.00	0.11	0.00	0.63	0.61	0.59
10	0.47	0.15	0.09	0.00	0.16	0.19	0.00	0.00	0.11	0.16
11	0.00	0.63	0.00	0.00	0.00	0.00	0.66	0.11	0.13	0.00
12	0.00	0.08	0.00	0.00	0.00	0.11	0.19	0.00	0.00	0.00
13	0.00	0.00	0.00	0.17	0.00	0.00	0.00	0.00	0.00	0.00
>13	0.20	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Table 14. CUE-at-age (#/net) for harvested and released lake whitefish caught in impoundment nets in management area 4-2.

AGE	1986	1987	1988	1989	1990	1991
1	0.3		1.9	0.0	0.2	0.2
2	5.8		28.9	6.4	22.8	13.1
3	77.1		39.7	13.7	116.4	81.3
4	65.7	N	55.1	14.7	42.4	114.4
5	34.0	O	84.8	17.6	13.3	16.2
6	12.3		20.4	22.7	8.5	2.5
7	1.4	D	7.7	9.0	6.1	1.2
8	0.3	A	2.1	2.2	2.7	0.2
9	0.0	T	0.0	0.6	0.6	0.6
10	0.2	A	0.0	0.0	0.1	0.2
11	0.0		0.7	0.1	0.1	0.0
12	0.0		0.2	0.0	0.0	0.0
13	0.0		0.0	0.0	0.0	0.0
>13	0.0		0.0	0.0	0.0	0.0

CHUB

- Allocation remained at 43,582 kgs. Quota issued equalled the allocation.
- Harvest decreased 5% to 40,771 kgs, 94% of the allocation (Figure 12).
- Effort increased 34% to 426 kms (Figure 13).
- CUE (harvest + discards) decreased 25% to 206 kgs/kms (Figure 14). The discard component increased 88% to 9.8 kgs/km.
- The strong year-classes from 1982 to 1984 (ages 7,8,9) continue to support the fishery (Table 15).
- Abundance unexpectedly decreased as the weak 1985 and 1986 year-classes entering the fishery failed to offset the decline in the 1982 to 1983 year-classes (Table 16).
- Abundance will continue to decline in 1992 as the impact of the weak 1985 through 1987 year-classes is felt. Although the large 1988 year-class will begin to enter the fishery in numbers in 1993, overall abundance will continue to decline. However, it should be recognized that chub stocks are at very high levels with resulting undesirable density effects on growth and sex ratios.

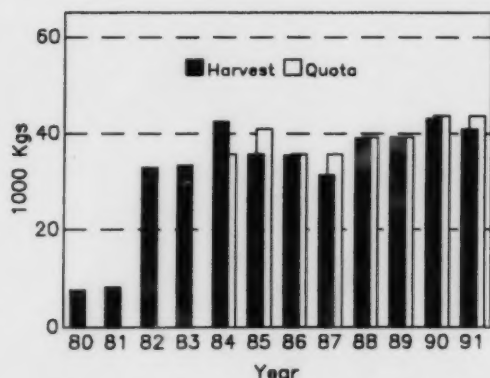


Figure 12. Chub harvest and quota (kgs) for management area 4-2.

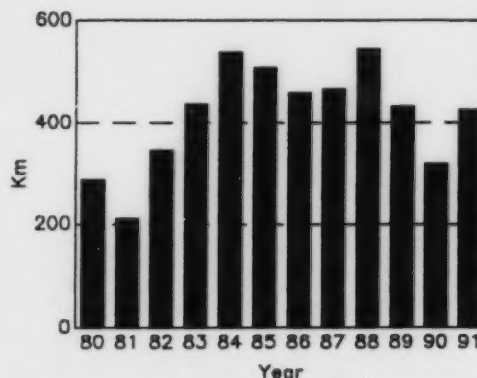


Figure 13. Chub annual gill net effort (km) for management area 4-2.

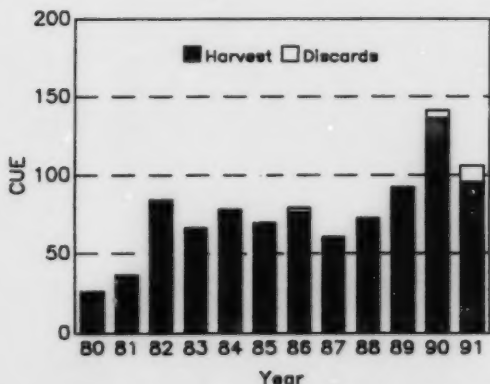


Figure 14. Annual chub (harvest + discard) gill net CUEs (kgs/km) for management area 4-2. CUEs corrected for discarding 1986 onward.

Table 15. Age-class composition of harvested and discarded chub in gill nets in management area 4-2.

AGE	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
1	0	0	0	0	0	0	0	0	0	0	93	0
2	0	0	0	0	0	0	0	41	0	23	931	0
3	2616	1164	0	1648	0	448	491	786	231	227	428	2459
4	3151	19665	31040	17128	11187	3125	6227	6785	1863	172	664	1524
5	3658	5713	76945	66859	23422	47056	23367	20994	33715	9598	11731	5810
6	7450	3520	10632	49921	112315	44152	58124	38157	63111	61395	47249	26913
7	8665	2329	5907	4150	42223	59211	45853	50686	58561	63761	82831	71828
8	1763	3688	8093	3028	2932	14192	29792	26742	24246	43697	53111	67460
9	501	939	9973	1599	1120	4700	5655	6143	6799	15810	9320	32433
10	140	385	1331	1490	0	89	0	440	1497	4630	3564	4866
11	0	48	330	109	0	589	0	60	312	379	0	911
12	140	0	0	0	0	89	341	0	0	0	0	419
13	0	0	0	0	0	52	0	0	0	0	0	0
>13	0	0	0	109	0	0	0	0	0	0	0	0

Note: corrected for discarding 1987 onward.

Table 16. CUE-at-age (#/km) for harvested and discarded chub in gill nets in management area 4-2.

AGE	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.29	0.00
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.00	0.05	2.94	0.00
3	9.11	5.54	0.00	3.77	0.00	0.88	1.07	1.68	0.42	0.53	1.35	5.77
4	10.98	93.60	89.97	39.19	20.83	6.15	13.58	14.54	3.42	0.40	2.09	3.58
5	12.75	27.19	223.03	153.00	43.62	92.67	50.96	44.99	61.98	22.26	36.99	13.64
6	25.96	16.75	30.82	114.24	209.15	86.95	126.77	81.78	116.01	142.41	149.00	63.18
7	30.19	11.09	17.12	9.50	78.63	116.60	100.01	108.63	107.65	147.90	261.21	168.61
8	6.14	17.55	23.46	6.93	5.46	27.95	64.98	57.31	44.57	101.36	167.49	158.36
9	1.75	4.47	28.91	3.66	2.09	9.26	12.33	13.17	12.50	36.67	29.39	76.13
10	0.49	1.83	3.86	3.41	0.00	0.18	0.00	0.94	2.75	10.74	11.24	11.42
11	0.00	0.23	0.96	0.25	0.00	1.16	0.00	0.13	0.57	0.88	0.00	2.14
12	0.49	0.00	0.00	0.00	0.00	0.18	0.74	0.00	0.00	0.00	0.00	0.98
13	0.00	0.00	0.00	0.00	0.00	0.10	0.00	0.00	0.00	0.00	0.00	0.00
>13	0.00	0.00	0.00	0.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Note: corrected for discards 1987 onward.

MANAGEMENT AREA 4-3



GENERAL

- The total commercial fish allocation for all fish species under quota control increased 13% to 187,832 kgs (Table 17). Primarily the result of a 23% increase in the lake whitefish allocation.
- Quota issued on commercial fish licences equalled the commercial fish allocation.
- Harvest of all fish species under quota control increased 20% to 142,313 kgs. Lake whitefish, one of the primary commercial fish species in this management area, accounted for the bulk of the increase in harvest. Value of the harvest of species under quota control increased 4% to \$293,742.
- Harvest and value of all fish species sold was 142,906 kgs and \$295,121, respectively (Table 18). An additional 9,929 kgs of species of no commercial value were reported discarded.

Table 17. Allocation, quota, harvest and percent quota taken by quota species for management area 4-3, 1991.

Species	Allocation (kgs)	Quota (kgs)	Harvest (kgs)	% Quota Taken
Channel Catfish	4835	4835	161	3.3
Chub	65751	65751	33334	50.7
Lake Sturgeon	244	244	9	3.7
Lake Trout	1871	1871	1837	98.2
Lake Whitefish	108377	108377	105934	97.7
Northern Pike	927	927	200	21.6
Pink Salmon	1729	1729	34	2.0
Walleye	850	850	62	7.3
Yellow Perch	3248	3248	742	22.8
Total	187832	187832	142313	

Table 18. Value, harvest and catch by species for management area 4-3, 1991.

Species	Value (\$)	Harvest (kgs)	Catch (kgs)
Burbot	0	0	3112
Caviar	13	11	11
Channel Catfish	121	161	161
Chinook Salmon	0	0	7
Chub	87698	33334	33334
Common Carp	99	169	169
Freshwater Drum	8	12	12
Lake Herring	62	117	117
Lake Sturgeon	30	9	9
Lake Trout	3111	1837	2056
Lake Whitefish	202206	105934	105934
Northern Pike	346	200	200
Pacific Salmon	0	0	41
Pink Salmon	44	34	34
Rainbow Smelt	0	0	57
Rainbow Trout	0	0	9
Round Whitefish	196	285	285
Suckers	0	0	212
Walleye	185	62	62
White Bass	1	1	3
Yellow Perch	1	742	742
Discarded (mixed)	0	0	6268
Total	294121	142906	152835

LAKE WHITEFISH

- The allocation increased 23% to 108,377 kgs. Quota issued equalled the allocation.
- The harvest rose 52% to 105,934 kgs, 98% of the allocation (Figure 15).
- Gill net effort rose 15% to 1,099 kms (Figure 16).
- CUE increased 25% to 96 kgs/km (Figure 17).
- Age 4 and 5 fish dominated the catch as predicted (Table 19).
- Abundance increased as expected due to the contribution of age 4 (1987 year-class) and 5 (1986 year-class) fish (Table 20).
- Abundance should increase in 1992 with the entry of the strong 1988 year-class (Table 14, page 19); however, if older fish continue to inexplicably disappear from the fishery, abundance will remain at or below current levels. This uncertainty precludes abundance forecasting for 1993.

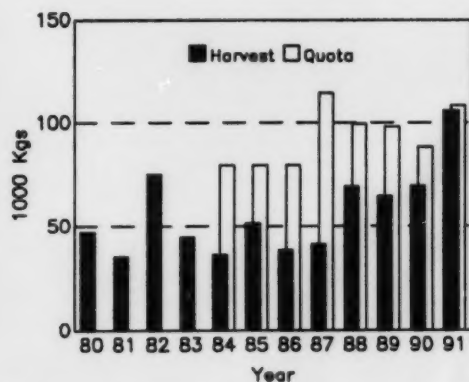


Figure 15. Lake whitefish harvest and quota (kgs) for management area 4-3.

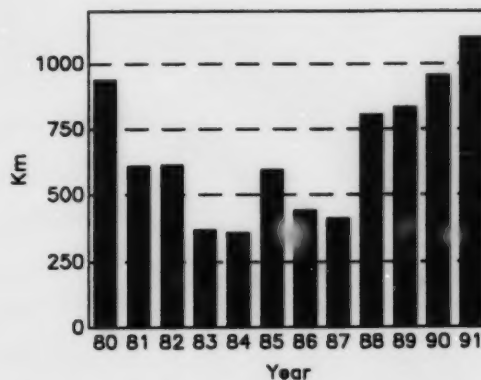


Figure 16. Lake whitefish annual gill net effort (km) for management area 4-3.

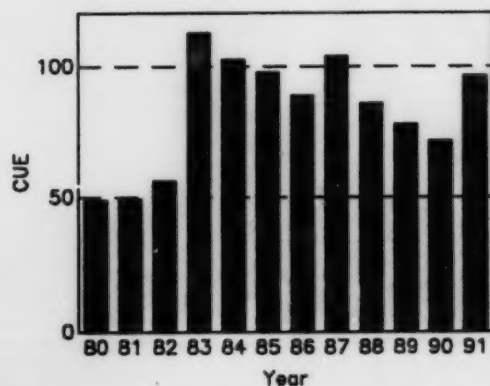


Figure 17. Lake whitefish annual gill net CUEs (kgs/km) for management area 4-3.

Table 19. Age-class composition of lake whitefish harvested in gill nets in management area 4-3.

AGE	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
1	0	0	0		0	0	0		0	0	0	0
2	0	0	0		0	0	0		0	0	0	81
3	5851	84	766		569	365	52		163	231	428	2062
4	12626	19693	10699	N	16359	5231	7915	N	5287	5805	14340	34909
5	12671	3428	14998	O	10448	24562	8621	O	22619	12722	11269	27607
6	2470	3426	957		1559	7433	5053		16525	15430	7915	4621
7	1165	678	326	D	1080	2265	2254	D	3064	6422	4474	1291
8	938	367	49	A	0	2260	935	A	658	1384	4514	1311
9	96	395	126	T	71	68	1233	T	123	579	1063	1074
10	0	114	49	A	0	0	86	A	172	250	331	1075
11	72	0	0		0	0	52		93	0	248	204
12	0	0	0		0	0	0		0	0	152	0
13	72	0	0		0	0	0		0	0	124	0
>13	0	0	0		0	0	0		0	0	0	0

Table 20. CUE-at-age (number/km) for lake whitefish harvested in gill nets in management area 4-3.

AGE	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
1	0.00	0.00	0.00		0.00	0.00	0.00		0.00	0.00	0.00	0.00
2	0.00	0.00	0.00		0.00	0.00	0.00		0.00	0.00	0.00	0.07
3	6.25	0.14	1.25		1.60	0.62	0.12		0.20	0.28	0.45	1.88
4	13.49	32.37	17.46	N	46.04	8.82	18.01	N	6.57	6.98	15.05	31.79
5	13.54	5.63	24.48	O	29.41	41.43	19.62	O	28.09	15.30	11.82	25.14
6	2.64	5.63	1.56		4.39	12.54	11.50		20.53	18.55	8.31	4.21
7	1.24	1.11	0.53	D	3.04	3.82	5.13	D	3.81	7.72	4.69	1.18
8	1.00	0.60	0.08	A	0.00	3.81	2.13	A	0.82	1.66	4.74	1.19
9	0.10	0.65	0.21	T	0.20	0.11	2.81	T	0.15	0.70	1.12	0.98
10	0.00	0.19	0.08	A	0.00	0.00	0.20	A	0.21	0.30	0.35	0.98
11	0.08	0.00	0.00		0.00	0.00	0.12		0.12	0.00	0.26	0.19
12	0.00	0.00	0.00		0.00	0.00	0.00		0.00	0.00	0.16	0.00
13	0.08	0.00	0.00		0.00	0.00	0.00		0.00	0.00	0.13	0.00
>13	0.00	0.00	0.00		0.00	0.00	0.00		0.00	0.00	0.00	0.00

CHUB

- Allocation remained unchanged at 65,751 kgs. Quota issued equalled the allocation.
- Harvest decreased 26% to 33,334 kgs, 51% of the allocation (Figure 18).
- Effort decreased 2% to 422 kms (Figure 19).
- CUE (harvest + discards) decreased 25% to 90 kgs/km (Figure 20). The discard component decreased 27% to 11 kgs/km.
- The strong year-classes from 1982 to 1984 (ages 7,8,9) continue to support the fishery (Table 21).
- Abundance unexpectedly decreased as the the weak 1985 and 1986 year-classes entering the fishery failed to offset the decline in the 1982 and 1983 year-classes (Table 22).
- Abundance will continue to decline in 1992 as the impact of the weak 1985 through 1987 year-classes is felt. Although the large 1988 year-class will begin to enter the fishery in numbers in 1993 (Figure 31, page 34), overall abundance will continue to decline. However, it should be recognized that chub stocks are at very high levels with resulting undesirable density effects on growth and sex ratios.

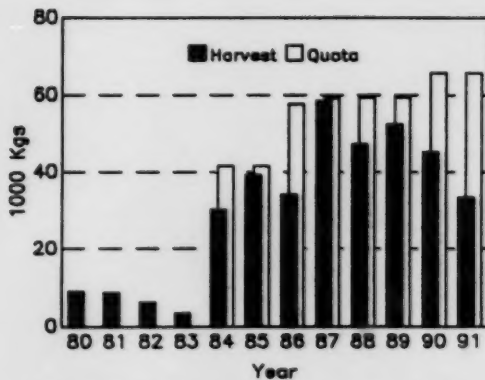


Figure 18. Chub harvest and quota (kgs) for management area 4-3.

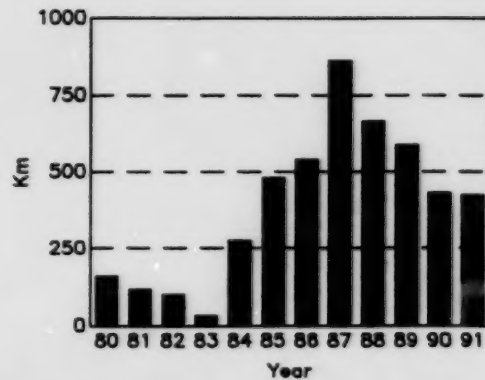


Figure 19. Chub annual gill net effort (km) for management area 4-3.

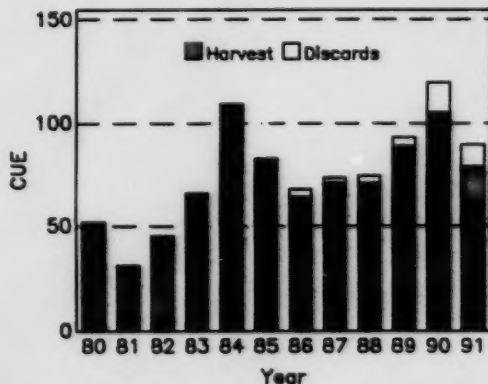


Figure 20. Annual chub (harvest+discards) gill net CUEs (kgs/km) for management area 4-3. Corrected for discarding 1986 onward.

Table 21. Age-class composition of harvested and discarded chub in gill nets in management area 4-3.

AGE	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
1	0				0	0	0		0	0	0	0
2	148				0	0	0		0	0	2320	0
3	6797				0	0	663		179	0	0	214
4	7535	N	N	N	34179	2417	11925	N	9743	746	737	535
5	5642	O	O	O	53140	31947	19555	O	70016	22137	10268	6913
6	7266				47162	28788	53775		77769	90033	47434	19500
7	8608	D	D	D	14634	78721	47403	D	62998	88014	94890	74935
8	2558	A	A	A	584	38269	27383	A	30239	38208	62466	59458
9	641	T	T	T	0	1315	8115	T	6393	8429	19470	23351
10	360	A	A	A	3160	3044	766	A	480	4150	2003	2252
11	212				2576	0	536		0	298	0	1306
12	0				2576	0	0		0	0	0	0
13	0				0	0	0		0	0	0	0
>13	0				0	0	0		0	0	501	0

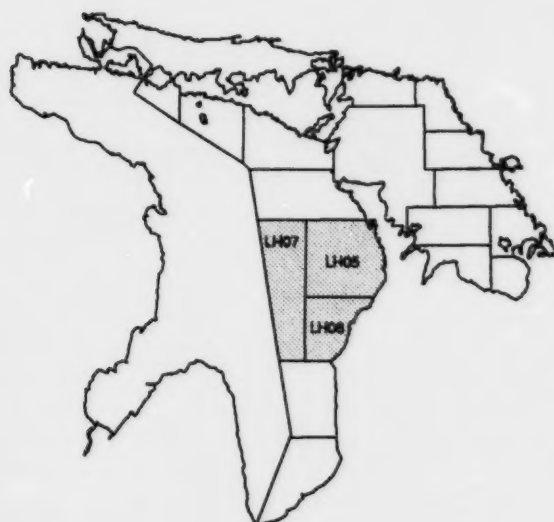
Note: corrected for discards 1988 onward.

Table 22. CUE-at-age (#/km) for harvested and discarded chub in gill nets in management area 4-3.

AGE	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
1	0.00				0.00	0.00	0.00		0.00	0.00	0.00	0.00
2	0.93				0.00	0.00	0.00		0.00	0.00	5.41	0.00
3	42.59				0.00	0.00	1.24		0.27	0.00	0.00	0.51
4	47.21	N	N	N	124.38	5.05	22.21	N	14.71	1.27	1.72	1.27
5	35.35	O	O	O	193.38	66.71	36.43	O	105.68	37.72	23.94	16.39
6	45.53				171.62	60.11	100.18		117.39	153.40	110.57	46.23
7	53.93	D	D	D	53.25	164.38	88.31	D	95.09	149.96	221.19	177.66
8	16.03	A	A	A	2.13	79.91	51.01	A	45.64	65.10	145.61	140.96
9	4.02	T	T	T	0.00	2.75	15.12	T	9.65	14.36	45.39	55.36
10	2.26	A	A	A	11.50	6.36	1.43	A	0.72	7.07	4.67	5.34
11	1.33				9.37	0.00	1.00		0.00	0.51	0.00	3.10
12	0.00				9.37	0.00	0.00		0.00	0.00	0.00	0.00
13	0.00				0.00	0.00	0.00		0.00	0.00	0.00	0.00
>13	0.00				0.00	0.00	0.00		0.00	0.00	1.17	0.00

Note: corrected for discards 1988 onward.

MANAGEMENT AREA 4-4



GENERAL

- The total commercial fish allocation for all fish species under quota control increased 11% to 713,204 kgs (Table 23), the result of a 20% increase in the lake whitefish allocation.
- Quota issued on commercial fish licences equalled the commercial fish allocation.
- Harvest of all fish species under quota control increased 11% to 633,846 kgs. Lake whitefish, one of the primary commercial fish species in this management area, accounted for the bulk of the increase in harvest. Value of the harvest of species under quota control increased 5% to \$1,407,611.
- Harvest and value of all fish species sold was 634,294 kgs and \$1,407,782, respectively (Table 24). An additional 1,393 kgs of species of no commercial value were reported discarded.

Table 23. Allocation, quota, harvest and percent quota taken by quota species for management area 4-4, 1991.

Species	Allocation (kgs)	Quota (kgs)	Harvest (kgs)	% Quota Taken
Channel Catfish	unlimited	unlimited	325	n/a
Chub	258385	258385	193481	74.9
Lake Sturgeon	100	100	0	0.0
Lake Trout	1582	1582	2006	126.8
Lake Whitefish	432293	432293	424170	98.1
Northern Pike	393	393	14	3.6
Pink Salmon	1456	1456	0	0.0
Walleye	742	742	655	88.3
Yellow Perch	18253	18253	13424	73.5
Total	713204	713204	633046	

Table 24. Value, harvest and catch by species for management area 4-4, 1991.

Species	Value (\$)	Harvest (kgs)	Catch (kgs)
Burbot	0	0	681
Channel Catfish	248	325	325
Chub	304420	193481	193481
Common Carp	2	10	10
Gizzard Shad	0	0	454
Lake Herring	21	25	36
Lake Trout	5442	2006	2006
Lake Whitefish	1037979	424170	424170
Northern Pike	6	14	14
Pacific Salmon	0	0	20
Round Whitefish	57	125	125
Shortjaw Cisco	0	1029	1029
Suckers	0	0	227
Walleye	1945	655	655
White Bass	91	59	59
Yellow Perch	57571	13424	13424
Total	1407782	634294	635,687

LAKE WHITEFISH

- The allocation rose 20% to 432,293 kgs. Quota issued equalled allocation.
- The harvest rose 17% to 424,179 kgs, 98% of the allocation (Figure 21). Most of the harvest occurred in LH05 (90%) (Figure 22).
- Gill net effort dropped 5% to 1198 kms (Figure 23).
- CUE in assessment area LH05 increased 25% to 359 kgs/km (Figure 24).
- Age 4 and 5 fish continue to dominate the fishery (Tables 25,26).
- Abundance increased as predicted in 1991 as the strong 1987 year-class entered the fishery.
- Abundance will continue to increase in 1992 with the continued recruitment of the strong 1987 year-class as age 5 fish. Although contribution of age 4 fish (1988 year-class) will be down from that of the previous two years, it will still be about average for the last decade (Figure 25, page 32). Due to the build up in biomass during the last three years, as a result of good-to-strong year-classes, abundance will remain high in 1993 even though recruitment is expected to drop.

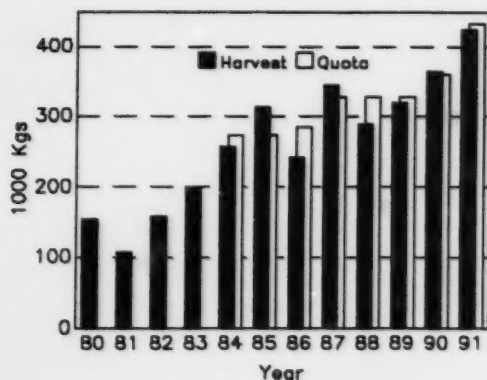


Figure 21. Lake whitefish harvest and quota (kgs) for management area 4-4.

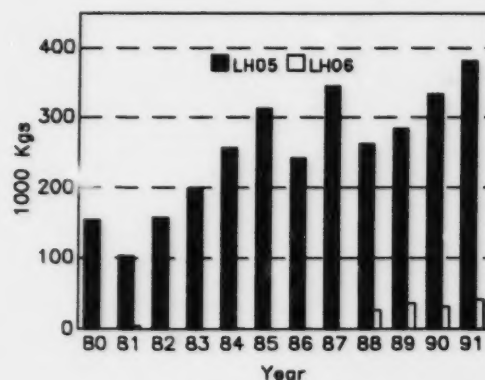


Figure 22. Lake whitefish harvest (kgs) by subarea for management area 4-4.

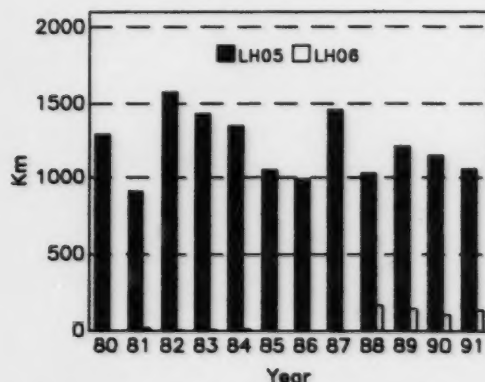


Figure 23. Lake whitefish gill net effort (km) by subarea for management area 4-4.

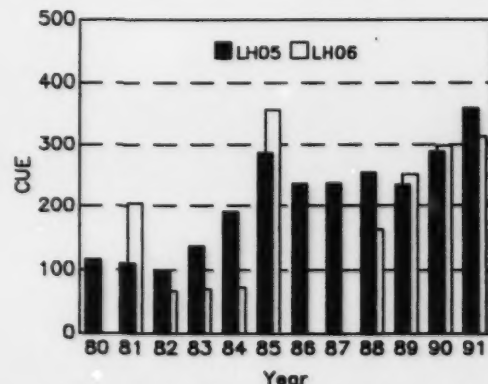


Figure 24. Lake whitefish annual gill net CUEs (kgs/km) by subarea for management area 4-4.

Table 25. Age-class composition of lake whitefish harvested in gill nets in management area 4-4.

AGE	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
1	0		0	100	0	0	0	0	0	0	0	0
2	1996		3365	511	0	212	0	0	0	0	0	0
3	110787		72799	44881	17847	27917	6782	12432	16471	4313	6620	6946
4	7457	N	34437	106749	155251	165081	93226	117690	78137	150873	129856	131869
5	13549	O	23516	10738	27976	47013	70423	82364	42774	36958	95058	101877
6	4066		1889	6218	6096	4349	10833	34697	19099	9123	20719	34312
7	769	D	165	203	5236	888	2950	9769	9385	7926	9605	8343
8	687	A	485	0	0	1962	1281	1371	2995	1701	8490	3502
9	253	T	165	411	982	193	804	228	1035	2722	5168	1644
10	461	A	847	203	463	193	206	367	445	794	372	1483
11	0		0	0	0	0	0	0	0	0	0	411
12	0		362	308	0	0	0	0	155	0	0	809
13	0		0	0	0	0	0	0	0	0	1103	0
>13	0		0	0	0	0	0	0	0	0	0	0

Table 26. CUE-at-age (number/km) for lake whitefish harvested in gill nets in management area 4-4.

AGE	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
1	0.00		0.00	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	1.55		2.14	0.36	0.00	0.20	0.00	0.00	0.00	0.00	0.00	0.00
3	85.83		46.28	31.45	13.22	26.50	6.84	8.54	16.01	3.56	5.75	6.61
4	5.78	N	21.89	74.80	115.03	156.70	93.98	80.81	75.93	124.69	112.73	125.45
5	10.50	O	14.95	7.52	20.73	44.63	70.99	56.55	41.57	30.54	82.52	96.91
6	3.15		1.20	4.36	4.52	4.13	10.92	23.82	18.56	7.54	17.99	32.64
7	0.60	D	0.10	0.14	3.88	0.84	2.97	6.71	9.12	6.55	8.34	7.94
8	0.53	A	0.31	0.00	0.00	1.86	1.29	0.94	2.91	1.41	7.37	3.33
9	0.20	T	0.10	0.29	0.73	0.18	0.81	0.16	1.01	2.25	4.49	1.56
10	0.36	A	0.54	0.14	0.34	0.18	0.21	0.25	0.43	0.66	0.32	1.41
11	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.39
12	0.00		0.23	0.22	0.00	0.00	0.00	0.00	0.15	0.00	0.00	0.77
13	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.96	0.00
>13	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

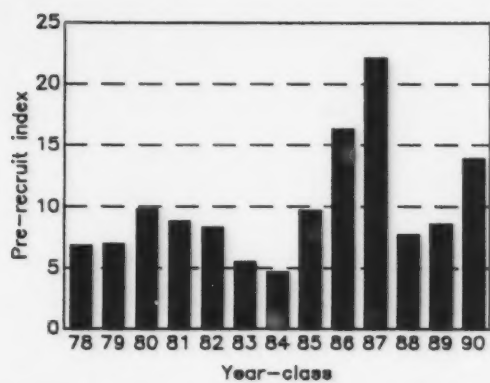


Figure 25. Indices of year-class strength for lake whitefish from index gillnetting in management area 4-4.

CHUB

- Allocation remained unchanged at 258,385 kgs. Quota issued equalled the allocation.
- Harvest increased 3% to 193,481 kgs, 74% of the allocation (Figure 26).
- Effort increased 40% to 1,312 kms (Figure 28).
- CUE of harvested fish decreased in all three subareas (Figure 29).
- CUE (harvest + discards) decreased 3% to 177 kgs/km (Figure 30). The discard component increased 71% to 31 kgs/km. This small decrease is likely the result of a move towards larger mesh sizes.
- The strong 1983 and 1984 year-classes (ages 7,8) continue to support the fishery (Tables 27, 28). The poor contribution of the 1985 through 1987 year-classes in commercial gear confirms the weakness predicted from index fishing (Table 29, 30).
- Abundance remained high as predicted.
- The weak 1985 through 1987 year-classes will begin to depress abundance in 1992. Although the large 1988 year-class will begin to enter the fishery in numbers in 1993, overall abundance will continue to decline (Figure 31). However, it should be recognized that chub stocks are at very high levels with resulting undesirable density effects on growth and sex ratios.

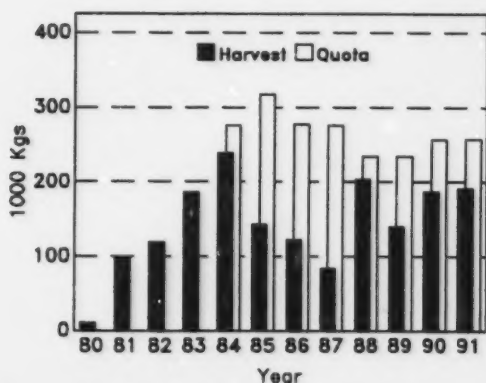


Figure 26. Chub harvest and quota (kgs) for management area 4-4.

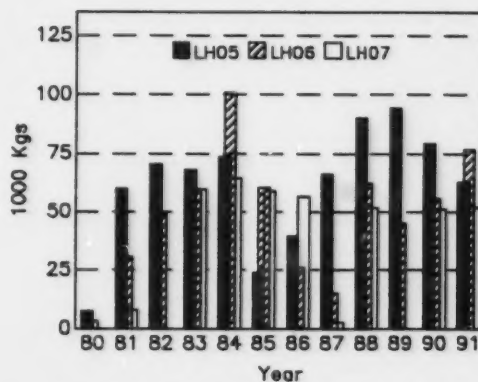


Figure 27. Chub harvest (kgs) by subarea for management area 4-4.

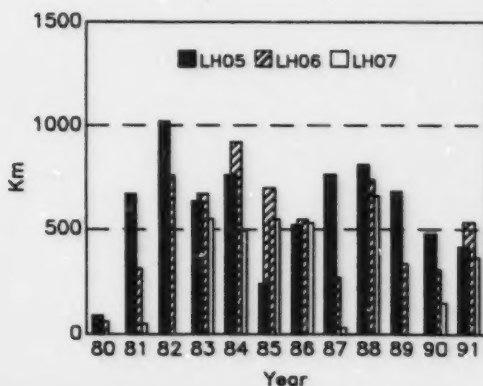


Figure 28. Chub annual gill net effort (km) by subarea for management area 4-4.

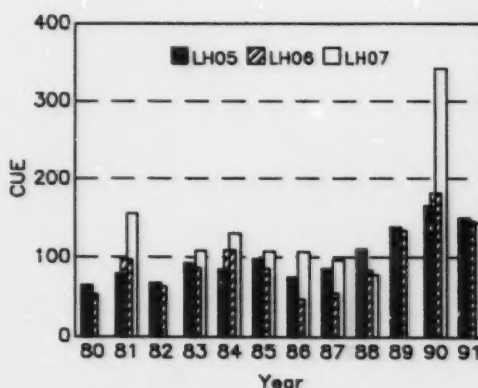


Figure 29. Chub annual gill net CUEs (kgs/km) by subarea for management area 4-4.

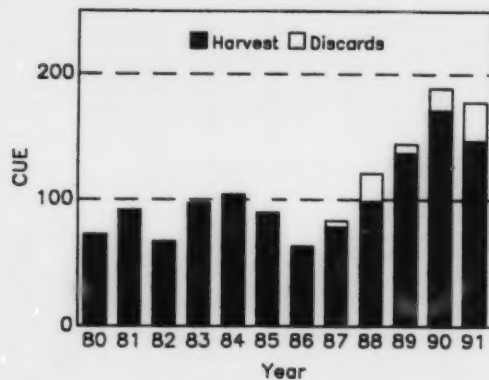


Figure 30. Annual chub (harvest + discards) gill net CUEs (kgs/km) for management area 4-4. Corrected for discarding 1986 onward.

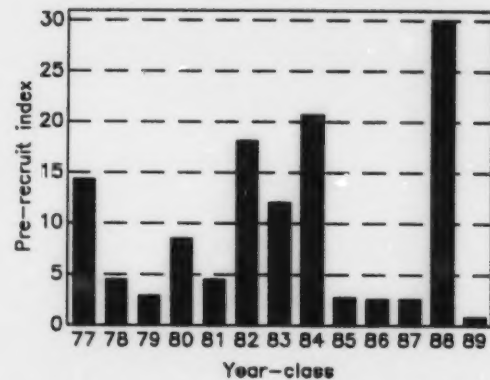


Figure 31. Indices of year-class strength for chub from index gillnetting in management area 4-4.

Table 27. Age-class composition of harvested and discarded chub in gill nets in assessment area LH05 (subarea of management area 4-4).

AGE	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
1	0	0	0	0	0	0	0	0	0	0	0	0
2	0	473	0	0	0	0	0	0	0	0	1383	0
3	22404	34215	4779	2796	4309	8016	1443	4854	22957	726	0	1306
4	7755	279792	86986	20480	41674	25245	25039	25413	119011	1568	0	1048
5	8617	18361	262116	196207	80006	35893	34221	119588	252048	117513	22806	12699
6	2585	473	11385	159715	143749	17229	96928	100968	200703	272661	171302	43386
7	1724	3286	2344	0	112698	26561	38082	101177	88463	81690	121108	155035
8	0	2144	0	0	4474	6700	13793	32762	14512	21952	75496	59818
9	0	473	0	0	1348	0	3250	7169	2286	0	8379	19557
10	0	473	0	0	0	0	0	1926	1250	0	0	1120
11	0	0	0	0	0	0	0	0	0	0	2332	0
12	0	0	0	0	0	0	0	0	0	0	2332	0
13	0	0	0	0	0	0	0	0	0	0	0	0
>13	0	0	0	0	0	0	0	0	0	0	0	0

Note: corrected for discards 1987 onward.

Table 28. Age-class composition of harvested and discarded chub in gill nets in assessment area LH06 (subarea of management area 4-4).

AGE	1983	1984	1985	1986	1987	1988	1989	1990	1991
1	0	0	0	0	0	0	0	0	0
2	756	0	0	0	0	0	0	0	0
3	12084	0	5948	1312	391	0	0	0	3953
4	31441	51418	28402	30528	11282	13710	3470	287	991
5	96763	156175	119842	26664	27564	85853	57901	14660	12217
6	141220	177427	81161	44601	20633	153753	106405	84791	71575
7	8000	106401	50210	21129	7955	35908	50441	98468	212550
8	2989	11518	14728	7517	11590	27421	12562	50325	89781
9	1493	4799	1957	2199	1977	8487	5947	10531	27713
10	804	6719	116	0	0	0	1101	3038	6056
11	0	0	0	0	0	653	0	1452	0
12	756	0	0	0	268	980	0	0	0
13	0	0	0	0	0	0	0	0	0
>13	0	0	0	0	0	0	0	0	0

Note: corrected for discards 1989 onward.

Table 29. CUE-at-age (#/km) for chub caught in gill nets in assessment area LH05 (subarea of management area 4-4).

AGE	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.00	0.71	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.88	0.00
3	257.52	51.00	4.69	4.43	5.66	33.26	2.77	6.35	28.34	1.07	0.00	3.32
4	89.14	417.04	85.41	32.45	54.73	104.75	48.00	33.27	146.91	2.30	0.00	2.67
5	99.05	27.37	257.35	310.90	105.08	148.93	65.60	156.55	311.13	172.41	47.46	32.30
6	29.71	0.71	11.18	253.07	188.80	71.49	185.79	132.17	247.75	400.03	356.51	110.34
7	19.82	4.90	2.30	0.00	148.01	110.21	73.00	132.45	109.20	119.85	252.05	394.29
8	0.00	3.20	0.00	0.00	5.88	27.80	26.44	42.89	17.91	32.21	157.12	152.13
9	0.00	0.71	0.00	0.00	1.77	0.00	6.23	9.38	2.82	0.00	17.44	49.74
10	0.00	0.71	0.00	0.00	0.00	0.00	0.00	2.52	1.54	0.00	0.00	2.85
11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.85	0.00
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.85	0.00
13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
>13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Note: corrected for discards 1987 onward.

Table 30. CUE-at-age (#/km) for harvested and discarded chub in gill nets in assessment area LH06 (subarea of management area 4-4).

AGE	1983	1984	1985	1986	1987	1988	1989	1990	1991
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	1.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	18.12	0.00	8.54	2.40	1.45	0.00	0.00	0.00	7.44
4	47.14	56.00	40.80	55.90	41.97	18.66	10.28	0.93	1.86
5	145.07	170.11	172.16	48.83	102.54	116.82	171.61	47.57	22.99
6	211.72	193.25	116.59	81.67	76.76	209.22	315.37	275.12	134.67
7	11.99	115.89	72.13	38.69	29.59	48.86	149.50	319.49	399.91
8	4.48	12.55	21.16	13.76	43.12	37.31	37.23	163.29	168.92
9	2.24	5.23	2.81	4.03	7.35	11.55	17.63	34.17	52.14
10	1.21	7.32	0.17	0.00	0.00	0.00	3.26	9.86	11.39
11	0.00	0.00	0.00	0.00	0.00	0.89	0.00	4.71	0.00
12	1.13	0.00	0.00	0.00	1.00	1.33	0.00	0.00	0.00
13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
>13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Note: corrected for discards 1989 onward.

YELLOW PERCH

- Allocation remained at 18,253 kgs. Quota issued equalled allocation.
- Harvest increased 10% to 13,424 kgs, 74% of the allocation (Figure 32). Most of the harvest (97%) came from LH05 (Figure 33).
- Effort increased 25% to 347 kms in LH05 (Figure 34).
- CUE decreased 4% to 36 kgs/km in LH05 (Figure 35).
- Preliminary commercial catch sampling indicates that the bulk of the harvest was composed of age 3 fish (1987 year-class).
- Abundance did not change significantly from 1990.
- The weak 1989 and 1990 year-classes will begin to reduce abundance in 1992 (Figure 36).

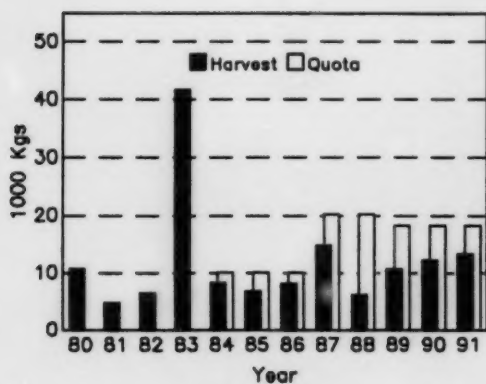


Figure 32. Yellow perch harvest and quota (kgs) for management area 4-4.

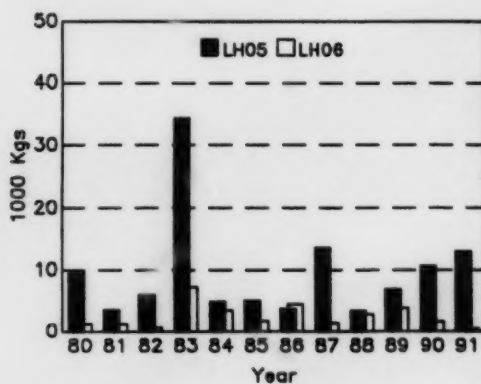


Figure 33. Yellow perch harvest (kgs) by subarea for management area 4-4.

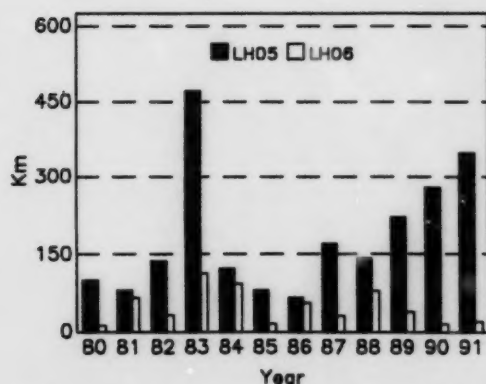


Figure 34. Yellow perch annual gill net effort (km) by subarea for management area 4-4.

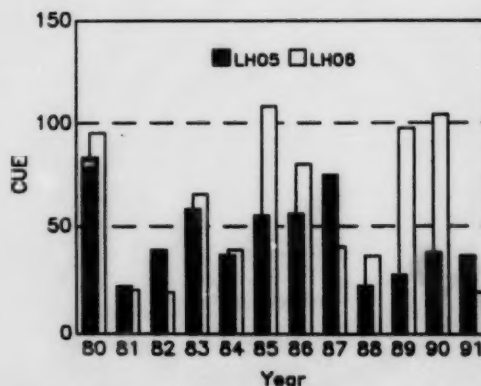


Figure 35. Yellow perch annual gill net CUEs (kgs/km) by subarea for management area 4-4.

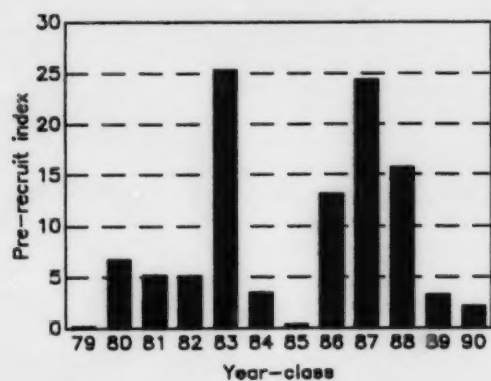


Figure 36. Indices of year-class strength for yellow perch from index gillnetting in management area 4-4.

LAKE TROUT/BACKCROSS

- Allocation remained at 1,582 kgs. Quota issued equalled allocation.
- Harvest increased to 2,006 kgs, 127% of the allocation (Figure 37). Most of the harvest came from LH05 (Figure 38).
- No prediction concerning future abundance for 1992 or 1993.

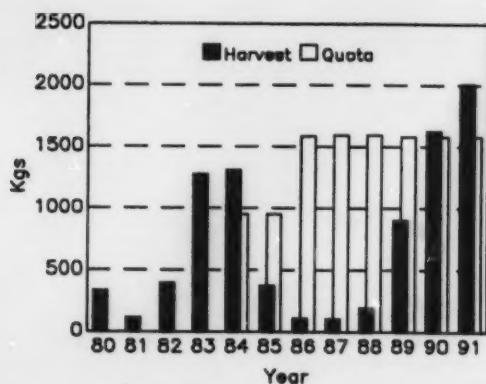


Figure 37. Lake trout/backcross harvest and quota (kgs) by subarea for management area 4-4.

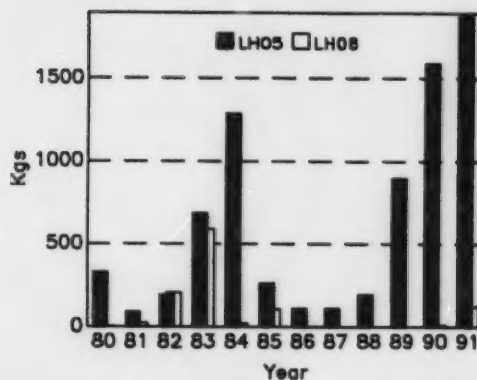
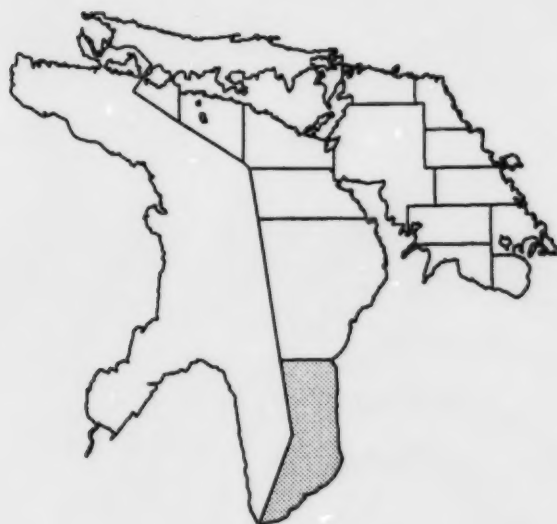


Figure 38. Lake trout/backcross harvest (kgs) by subarea for management area 4-4.

MANAGEMENT AREA 4-5**GENERAL**

- The total commercial fish allocation for all fish species under quota control increased 10% to 1,402,612 (Table 31), the result of increases in lake whitefish (20%) and yellow perch(6%) allocations.
- Quota issued on commercial fish licences equalled the commercial fish allocation.
- Harvest of all fish species under quota control increased 13% to 1,127,881 kgs. Lake whitefish, one of the primary commercial fish species in this management area, accounted for the bulk of the increase in harvest. Value of the harvest of species under quota control decreased 4% to \$3,258,156.
- Harvest and value of all fish species sold was 1,171,164 kgs and \$3,292,662 respectively (Table 32). An additional 4,310 kgs of species of no commercial value were reported discarded.

Table 31. Allocation, quota, harvest and percent quota taken by quota species for management area 4-5, 1991.

Species	Allocation (kgs)	Quota (kgs)	Harvest (kgs)	% Quota Taken
Channel Catfish	45679	45679	20798	45.5
Chub	153251	153251	20111	13.1
Lake Sturgeon	3587	3587	3368	93.9
Lake Trout	37096	37096	14726	39.7
Lake Whitefish	753515	753515	722236	95.8
Northern Pike	227	227	29	12.8
Pink Salmon	2218	2218	2	0.1
Walleye	125043	125043	122646	98.1
Yellow Perch	281996	281996	223965	79.4
Total	1402612	1402612	1127881	

Table 32. Value, harvest and catch by species for management area 4-5, 1991.

Species	Value (\$)	Harvest (kgs)	Catch (kgs)
Alewife	0	84	84
American Eel	45	22	22
Bigmouth Buffalo	23	34	34
Black Crappie	1	1	1
Brown Bullhead	0	0	30
Burbot	0	0	184
Channel Catfish	22607	20798	20798
Chub	36879	20111	20111
Common Carp	2752	3619	3619
Freshwater Drum	22978	30753	30753
Gizzard Shad	439	479	479
Lake Herring	3	1	1
Lake Sturgeon	17671	3368	3368
Lake Trout	29703	14726	14736
Lake Whitefish	1603911	722236	722236
Northern Pike	49	29	29
Pink Salmon	0	0	2

... continued

Table 32 (con't). Value, harvest and catch by species for management area 4-5, 1991.

Species	Value (\$)	Harvest (kgs)	Catch (kgs)
Rainbow Smelt	8	15	15
Redfin	3911	5312	5312
Round Whitefish	842	454	454
Suckers	0	0	4084
Walleye	537299	122646	122646
White Bass	2947	2119	2119
White Perch	558	392	392
Yellow Perch	1010037	223965	223965
Total	3292663	1171164	1175474

LAKE WHITEFISH

- The allocation increased 20% to 753,515 kgs. Quota issued equalled allocation.
- The harvest increased 20% to 722,956 kgs, 96% of the allocation (Figure 39). The gill net fishery accounted for 95% of the harvest with the remainder coming out of the trap net fishery (Figure 40).
- Gill net effort increased 39% to 2,851 kms (Figure 41).
- CUE in the gill net fishery decreased by 15% to 241 kgs/km (Figure 42).
- Age composition of the stock has improved substantially over the last ten years. The fishery now has a broad age base with ages 3 through 9 contributing significantly to the catch (Tables 33,34,35).
- Abundance did not increase as predicted in 1991. Although the strong 1988 year-class (age 3) entered the fishery as expected, the contribution of the fully recruited 1987 year-class (age 4) was less than expected (Tables 36,37,38).
- Abundance will increase with the entry of the strong 1989 year-class as age 3 fish and continued recruitment of the equally strong 1988 year-class as age 4 fish (Figure 43).

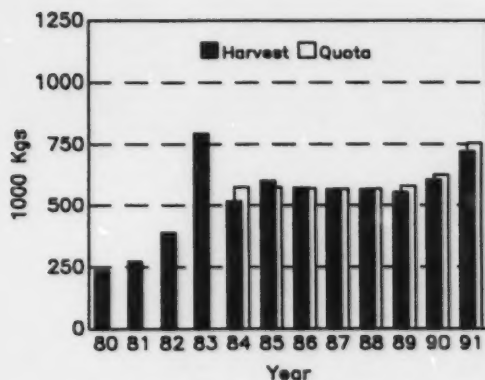


Figure 39. Lake whitefish harvest and quota (kgs) for management area 4-5.

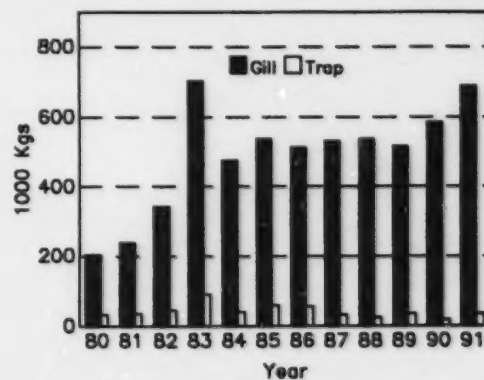


Figure 40. Lake whitefish harvest (kgs) for management area 4-5.

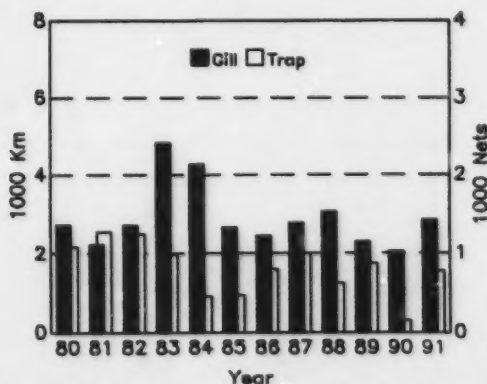


Figure 41. Lake whitefish annual gill net (km) and trap net (nets) effort for management area 4-5.

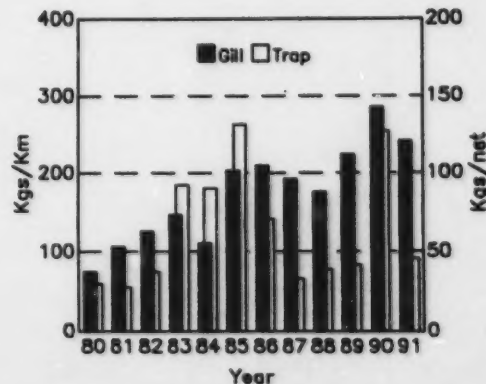


Figure 42. Lake whitefish annual CUEs (kgs/km) for management area 4-5.

Table 33. Age-class composition of lake whitefish harvested in gill nets in management area 4-5.

AGE	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
1	0	0	0	0	0	0	0	0	0	82	0	358
2	86554	137184	170969	51304	116317	777	5191	14478	40854	6367	8162	1200
3	91993	101276	126422	603216	219316	348481	93624	52500	92502	144943	74977	123214
4	9282	10159	20707	30538	80083	54405	231418	65232	52884	54603	159086	71250
5	2830	1326	1758	5785	5150	32440	20405	185180	46242	32589	36083	122220
6	48	993	226	1751	1871	6861	6738	33156	90621	28191	16979	29571
7	183	551	766	1446	346	1264	1169	16375	16090	62224	22812	18882
8	0	0	226	305	483	2372	1314	4573	10970	13677	44608	28888
9	0	0	0	0	0	81	321	3273	3528	7158	15065	34724
10	805	0	0	0	0	0	161	86	1241	2579	9176	8076
11	0	0	226	0	0	162	0	764	78	545	2231	2185
12	0	0	0	0	0	81	0	43	308	0	1151	358
13	0	0	0	0	0	0	0	0	149	222	0	179
>13	0	0	0	0	0	0	0	0	0	222	133	179

Table 34. Age-class composition of lake whitefish harvested in trap nets in management area 4-5.

AGE	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
1	0	0	0	0	0	0	0	0	0	0	0	0
2	0	0	5116	331	471	0	0	0	0	0	0	0
3	24322	32599	19085	84113	23765	61848	3603	3824	10107	19332	3940	7193
4	0	3622	4498	6069	11582	6486	36517	4894	2853	2180	5319	5738
5	0	0	3502	431	1638	585	1618	10367	1398	1090	591	4157
6	3475	0	69	39	378	21	2513	1640	3319	975	158	1870
7	0	0	646	0	252	0	222	885	504	3500	118	561
8	0	0	0	627	0	8	0	383	317	458	1182	1475
9	0	0	215	0	0	0	0	0	112	1032	158	2141
10	0	0	215	0	0	0	0	0	0	115	236	436
11	0	0	0	0	0	0	0	0	38	0	79	332
12	0	0	0	0	0	0	0	40	0	0	0	0
13	0	0	0	0	0	0	0	0	0	0	0	0
>13	0	0	0	0	0	0	170	0	0	0	39	0

Table 35. Age-class composition of harvested and released lake whitefish caught in trap nets in management area 4-5.

AGE	1986	1987	1988	1989	1990	1991
1	0	0	0	0	0	0
2	2939	10007	17286	6278	4057	9558
3	20131	12853	16566	36302	10466	44134
4	38349	5028	2853	2180	5319	6065
5	1618	10367	1398	1090	591	4157
6	2513	1640	3319	975	158	1870
7	222	885	504	3500	118	561
8	0	383	317	458	1182	1475
9	0	0	112	1032	158	2141
10	0	0	0	115	236	436
11	0	0	38	0	79	332
12	0	40	0	0	0	0
13	0	0	0	0	0	0
>13	170	0	0	0	39	0

Table 36. CUE-at-age (number/km) for lake whitefish harvested in gill nets in management area 4-5.

AGE	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.00	0.13
2	31.73	61.15	62.90	10.67	27.30	0.29	2.12	5.22	13.35	2.76	3.97	0.43
3	33.73	45.15	46.51	125.45	51.48	131.24	38.15	18.92	30.22	62.73	36.48	44.11
4	3.40	4.53	7.62	6.35	18.80	20.49	94.29	23.51	17.28	23.63	77.40	25.51
5	1.04	0.59	0.65	1.20	1.21	12.22	8.31	66.75	15.11	14.10	17.56	43.75
6	0.02	0.44	0.08	0.36	0.44	2.58	2.75	11.95	29.61	12.20	8.26	10.59
7	0.07	0.25	0.28	0.30	0.08	0.48	0.48	5.90	5.26	26.93	11.10	6.76
8	0.00	0.00	0.08	0.06	0.11	0.89	0.54	1.65	3.58	5.92	21.70	10.34
9	0.00	0.00	0.00	0.00	0.00	0.03	0.13	1.18	1.15	3.10	7.33	12.43
10	0.30	0.00	0.00	0.00	0.00	0.00	0.07	0.03	0.41	1.12	4.46	2.89
11	0.00	0.00	0.08	0.00	0.00	0.06	0.00	0.28	0.03	0.24	1.09	0.78
12	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.02	0.10	0.00	0.56	0.13
13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.10	0.00	0.06
>13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.10	0.06	0.06

Table 37. CUE-at-age (#/net) for lake whitefish harvested in trap nets in management area 4-5.

AGE	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.00	0.00	4.10	0.34	1.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	22.40	25.57	15.29	85.39	52.35	133.29	4.50	3.79	16.15	22.14	26.62	9.35
4	0.00	2.84	3.60	6.16	25.51	13.98	45.65	4.85	4.56	2.50	35.94	7.46
5	0.00	0.00	2.81	0.44	3.61	1.26	2.02	10.26	2.23	1.25	3.99	5.41
6	3.20	0.00	0.06	0.04	0.83	0.05	3.14	1.62	5.30	1.12	1.06	2.43
7	0.00	0.00	0.52	0.00	0.56	0.00	0.28	0.88	0.81	4.01	0.80	0.73
8	0.00	0.00	0.00	0.64	0.00	0.02	0.00	0.38	0.51	0.52	7.99	1.92
9	0.00	0.00	0.17	0.00	0.00	0.00	0.00	0.00	0.18	1.18	1.06	2.78
10	0.00	0.00	0.17	0.00	0.00	0.00	0.00	0.00	0.00	0.13	1.60	0.57
11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.00	0.53	0.43
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.00	0.00	0.00	0.00
13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
>13	0.00	0.00	0.00	0.00	0.00	0.00	0.21	0.00	0.00	0.00	0.27	0.00

Table 38. CUE-at-age (#/net) for harvested and released lake whitefish in trap nets in management area 4-5.

AGE	1986	1987	1988	1989	1990	1991
1	0.00	0.00	0.00	0.00	0.00	0.00
2	3.67	9.91	27.61	7.19	27.41	12.43
3	25.16	12.73	26.46	41.58	70.72	57.39
4	47.94	4.98	4.56	2.50	35.94	7.89
5	2.02	10.26	2.23	1.25	3.99	5.41
6	3.14	1.62	5.30	1.12	1.06	2.43
7	0.28	0.88	0.81	4.01	0.80	0.73
8	0.00	0.38	0.51	0.52	7.99	1.92
9	0.00	0.00	0.18	1.18	1.06	2.78
10	0.00	0.00	0.00	0.13	1.60	0.57
11	0.00	0.00	0.06	0.00	0.53	0.43
12	0.00	0.04	0.00	0.00	0.00	0.00
13	0.00	0.00	0.00	0.00	0.00	0.00
>13	0.21	0.00	0.00	0.00	0.27	0.00

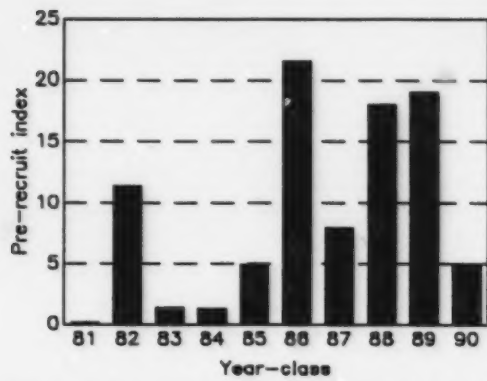


Figure 43. Indices of year-class strength for lake whitefish from index gillnetting in management area 4-5.

CHUB

- Allocation remained unchanged at 153,251 kgs. Quota issued equalled allocation.
- Harvest decreased 37% to 20,110 kgs, 13% of the allocation (Figure 44).
- Effort decreased 10% to 170 kms (Figure 45).
- CUE (harvest + discards) decreased 49% to 133 kgs/km (Figure 46). The discard component decreased 83% to 16 kgs/km. A move towards larger mesh sizes may have contributed to this decrease in CUE.
- The good-to-strong year-classes from 1983 to 1985 (ages 6,7,8) continue to support the fishery (Table 39).
- Abundance unexpectedly declined dramatically. The actual decline of harvestable fish was 30%, primarily the result of an earlier than predicted disappearance of older age-classes (age 7+) (Table 40). However, the decline in the discard component is likely the result of the shift towards larger mesh sizes.
- Abundance will continue to decrease in 1992 as the 1983 year-class exits the fishery and the impact of the weaker 1986 and 1987 year-classes is felt.

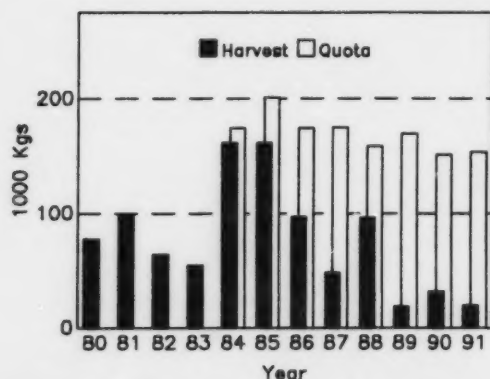


Figure 44. Chub harvest and quota (kgs) for management area 4-5.

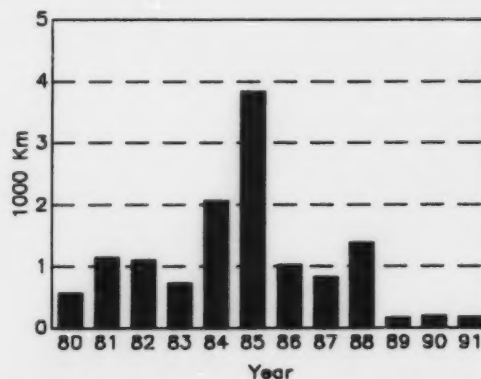


Figure 45. Chub annual gill net effort (km) for management area 4-5.

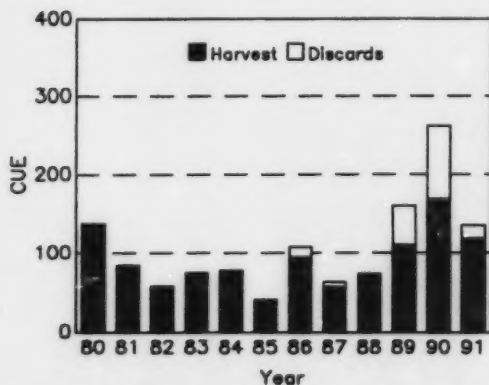


Figure 46. Annual chub (harvest + discards) gill net CUEs (kgs/km) for management area 4-5. CUEs corrected for discarding 1986 onward.

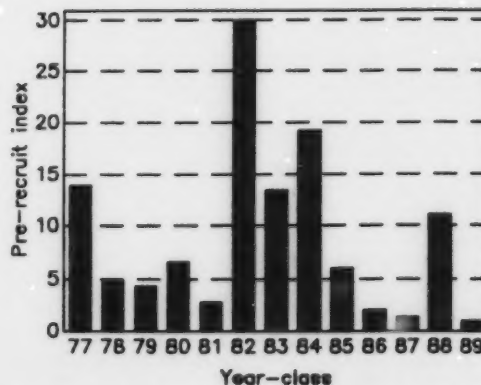


Figure 47. Indices of year-class strength for chub from USFWS trawling in management area 4-5.

Table 39. Age-class composition of harvested and discarded chub in gill nets in management area 4-5.

AGE	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
1	0	0		0	0	0	0	0	0	0	0	0
2	0	0		0	0	916	0	0	0	0	0	0
3	176322	16467		5677	13963	25090	2737	8098	3553	269	2048	1161
4	26334	341093	N	26470	88454	36677	51159	19775	57228	2794	6143	2323
5	27830	38196	O	102811	183668	263663	201604	65948	148592	22974	9379	5503
6	19539	37565		117042	277309	219236	173018	83825	259602	61298	74638	36542
7	24730	7919	D	3284	265402	177410	59781	62529	114200	45424	119025	51074
8	29719	10440	A	1892	15305	77612	23650	32084	35610	11756	50199	22205
9	8047	6658	T	1892	0	610	2136	9476	6874	6172	19948	3180
10	7224	630	A	0	0	0	276	694	1820	440	0	0
11	3976	0		0	0	0	0	938	1163	0	0	0
12	0	0		0	0	0	0	126	698	314	0	0
13	816	0		0	0	0	0	0	0	0	0	0
>13	0	0		0	0	0	0	0	0	0	0	0

Note: corrected for discards 1987 onward.

Table 40. CUE-at-age (#/km) for harvested and discarded chub in gill nets in management area 4-5.

AGE	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
1	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.00	0.00		0.00	0.00	0.24	0.00	0.00	0.00	0.00	0.00	0.00
3	310.32	14.32		7.87	6.77	6.55	2.70	9.75	2.56	1.59	10.86	6.97
4	46.35	296.60	N	36.70	42.89	9.57	50.39	23.80	41.30	16.54	32.57	13.94
5	48.98	33.21	O	142.56	89.06	68.79	198.57	79.37	107.25	136.02	49.73	33.03
6	34.39	32.67		162.29	134.46	57.20	170.41	100.88	187.37	362.92	395.75	218.34
7	43.52	6.89	D	4.55	128.69	46.28	58.88	75.25	82.43	268.94	631.10	306.56
8	52.30	9.08	A	2.62	7.42	20.25	23.29	38.61	25.70	69.60	206.17	133.28
9	14.16	5.79	T	2.62	0.00	0.16	2.10	11.40	4.96	36.54	105.77	19.09
10	12.71	0.55	A	0.00	0.00	0.00	0.27	0.84	1.31	2.61	0.00	0.00
11	7.00	0.00		0.00	0.00	0.00	0.00	1.13	0.84	0.00	0.00	0.00
12	0.00	0.00		0.00	0.00	0.00	0.00	0.15	0.50	1.86	0.00	0.00
13	1.44	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
>13	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Note: corrected for discards 1987 onward.

YELLOW PERCH

- Allocation increased 6% to 281,996 kgs. Quota issued equalled allocation.
- Harvest increased 21% to 222,467 kgs, 79% of the allocation (Figure 48). Most of the harvest (94%) came from the gill net fishery (Figure 49).
- Gill net effort increased 42% to 4,306 kms (Figure 50).
- Gill net CUE decreased 18% to 49 kgs/km (Figure 51).
- The catch was dominated by age 3 fish as predicted (Tables 41,42). Age 4 and 5 fish did not contribute as much as expected.
- Abundance unexpectedly decreased as a result of lower than expected contributions from age 4 and 5 fish (Table 43, 44).
- As a result of the fishery becoming increasingly dependent on a single age-class, the weaker 1989 year-class (Figure 52) will cause abundance to continue to decline in 1992. Preliminary indications are that the strong 1990 year-class would increase abundance in 1993.

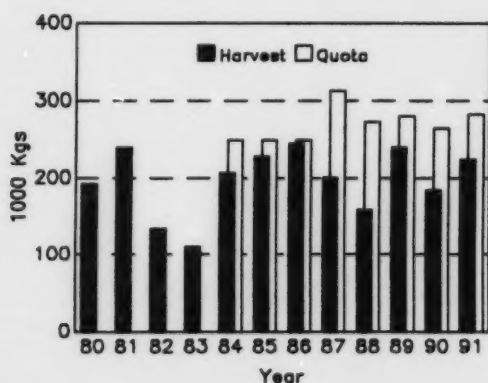


Figure 48. Yellow perch harvest and quota (kgs) for management area 4-5.

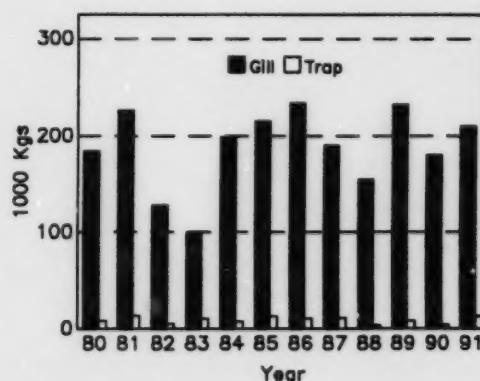


Figure 49. Yellow perch harvest (kgs) for management area 4-5.

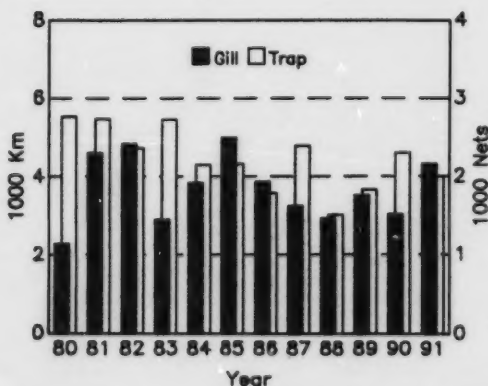


Figure 50. Yellow perch annual effort for management area 4-5.

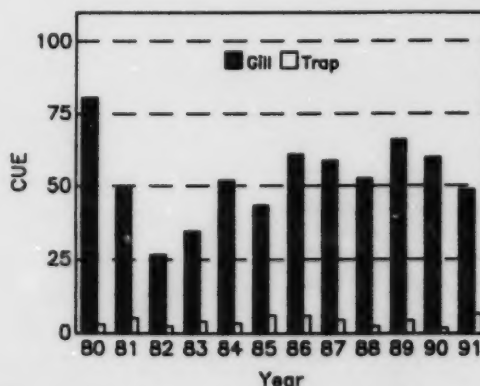


Figure 51. Yellow perch CUEs for management area 4-5.

Table 41. Age-class composition of yellow perch harvested in gill nets in management area 4-5.

AGE	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
1	0	0	0	0	1072	0	0	0	0	0	0	0
2	0	26067	162200	197313	17173	0	0	7281	26778	97921	73518	124309
3	892471	295096	315317	323503	1111419	504878	482108	104651	485360	1499624	765091	1185385
4	332561	1115011	110928	115643	222957	872250	900741	739238	443247	112601	574093	237446
5	31535	321517	218537	53838	22874	114652	479710	543132	265428	33860	14120	99406
6	9292	8860	16208	51655	10446	10518	23024	158854	57249	8531	7112	3782
7	3871	12103	7481	4194	2734	4266	989	15260	3602	6007	7176	4201
8	2323	0	1488	0	0	0	719	1308	1972	1550	7288	1185
9	0	1424	2231	0	0	0	719	693	0	1362	2581	1089
10	0	0	0	645	0	330	0	0	0	0	336	191
11	0	0	0	0	0	0	0	0	134	0	282	0
12	0	0	0	0	0	0	0	0	0	0	0	0
13	0	0	0	0	0	0	0	0	0	0	0	0
>13	0	0	0	0	0	0	0	0	0	0	0	0

Table 42. Age-class composition of yellow perch harvested in trap nets in management area 4-5.

AGE	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
1	0	0	0	0	0	0	0	0	0	0
2	977	10426	627	1104	0	745	81	1321	42	285
3	7264	31972	46913	38986	7015	2357	3352	25656	6274	30316
4	5364	10281	8421	45527	42597	17241	8432	7790	5273	20458
5	10670	6115	799	6164	14425	28070	4783	6264	813	19669
6	1106	6115	640	338	2510	12490	4776	1922	228	1057
7	507	1385	651	363	1328	3237	1268	3317	305	990
8	296	362	713	438	109	2911	238	1572	42	352
9	162	453	0	75	193	0	0	242	102	1275
10	0	0	62	0	78	0	41	96	42	285
11	0	0	62	151	0	447	0	0	0	0
12	0	0	0	0	0	0	0	0	0	0
13	0	0	0	0	0	0	0	0	0	0
>13	0	0	0	0	0	0	0	0	0	0

Table 43. CUE-at-age (number/km) for yellow perch harvested in gill nets in management area 4-5.

AGE	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
1	0.00	0.00	0.00	0.00	0.28	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.00	5.67	33.56	68.49	4.48	0.00	0.00	2.25	9.14	27.90	24.30	28.90
3	389.81	64.18	65.24	112.29	290.04	101.45	125.20	32.30	165.60	427.35	252.84	275.59
4	145.25	242.49	22.95	40.14	58.18	175.26	233.91	228.17	151.23	32.09	189.72	55.20
5	13.77	69.92	45.22	18.69	5.97	23.04	124.57	167.64	90.56	9.65	4.67	23.11
6	4.06	1.93	3.35	17.93	2.73	2.11	5.98	49.03	19.53	2.43	2.35	0.88
7	1.69	2.63	1.55	1.46	0.71	0.86	0.26	4.71	1.23	1.71	2.37	0.98
8	1.01	0.00	0.31	0.00	0.00	0.00	0.19	0.40	0.67	0.44	2.41	0.28
9	0.00	0.31	0.46	0.00	0.00	0.00	0.19	0.21	0.00	0.39	0.85	0.25
10	0.00	0.00	0.00	0.22	0.00	0.07	0.00	0.00	0.00	0.00	0.11	0.04
11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.00	0.09	0.00
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
>13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Table 44. CUE-at-age (number/nets) for yellow perch harvested in trap nets in management area 4-5.

AGE	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.17	0.97	0.08	0.08	0.00	0.07	0.02	0.16	0.02	0.14
3	1.29	2.96	6.20	2.94	0.67	0.21	0.88	3.15	2.74	15.20
4	0.95	0.95	1.11	3.43	4.05	1.55	2.21	0.96	2.30	10.25
5	1.89	0.57	0.11	0.46	1.37	2.52	1.25	0.77	0.35	9.86
6	0.20	0.57	0.08	0.03	0.24	1.12	1.25	0.24	0.10	0.53
7	0.09	0.13	0.09	0.03	0.13	0.29	0.33	0.41	0.13	0.50
8	0.05	0.03	0.09	0.03	0.01	0.26	0.06	0.19	0.02	0.18
9	0.03	0.04	0.00	0.01	0.02	0.00	0.00	0.03	0.04	0.64
10	0.00	0.00	0.01	0.00	0.01	0.00	0.01	0.01	0.02	0.14
11	0.00	0.00	0.01	0.01	0.00	0.04	0.00	0.00	0.00	0.00
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
>13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

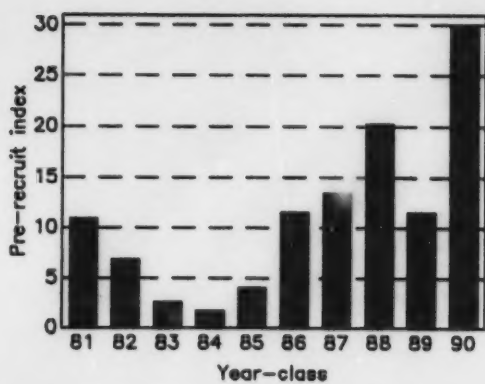


Figure 52. Indices of year-class strength for yellow perch from index gillnetting in management area 4-5.

WALLEYE

- Allocation decreased 10% to 125,043 kgs. Quota issued equalled allocation.
- Harvest decreased 5% to 123,016 kgs, 98% of the allocation (Figure 53). Most of the harvest (91%) came from the trap net fishery (Figure 54).
- Trap net effort increased 16% to 2,346 nets (Appendix Table 14, page 153).
- Trap net CUE decreased 20% to 48 kgs/net (Figure 55).
- As predicted, age 5,6,7 fish were well represented in the catch and age 4 fish were down substantially (Tables 45, 46).
- Abundance declined as predicted primarily due to the sharp drop in the abundance of recruiting age 4 fish (Tables 47, 48).
- Abundance will continue to decline in 1992 and 1993 due to continued recruitment of weak year-classes produced in 1987 through 1990 (Figure 56).

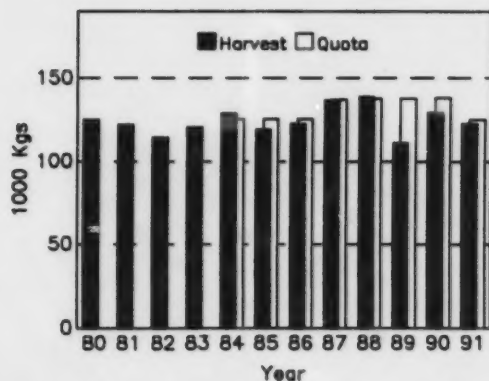


Figure 53. Walleye harvest and quota (kgs) for management area 4-5.

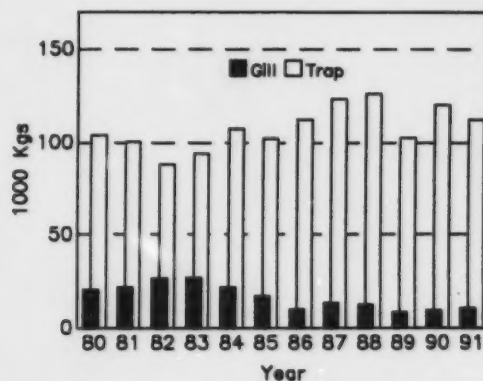


Figure 54. Walleye harvest (kgs) for management area 4-5.

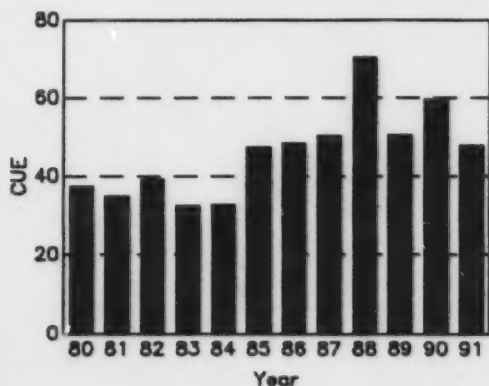


Figure 55. Walleye annual trap net CUEs (kgs/net) for management area 4-5.

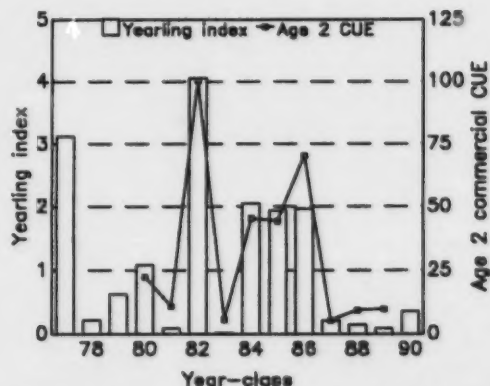


Figure 56. Indices of year-class strength from index fishing at Tremblay Creek, Lake St. Clair, and age 2 CUEs from commercial trap nets in management area 4-5.

Table 45. Age-class composition of walleye harvested in trap nets in management area 4-5.

AGE	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
1	381	1456	0	1506	858	215	286	293	1500	1785	276	4828
2	7410	25804	18308	15247	97187	2412	22911	42270	29008	5082	11846	13446
3	109515	9704	29297	80757	17375	117167	10378	76358	53907	54242	15713	17196
4	4632	62617	8334	15041	37095	6448	65787	8790	42338	20321	46477	7456
5	3859	3808	29132	4123	9017	7806	8113	22012	6727	15578	12818	20636
6	3264	2193	1417	8579	3911	1986	7021	2575	14480	2700	12141	10184
7	921	2372	619	602	8679	2150	3415	2856	1556	7185	2130	8442
8	1767	341	2161	911	820	3117	2364	801	2548	2237	8757	1930
9	1773	1355	1080	408	287	323	1209	1159	693	1479	2484	5876
10	1533	553	1382	378	191	238	502	621	668	362	1308	650
11	434	1199	410	18	342	144	171	158	160	623	581	237
12	125	262	326	244	96	238	0	0	0	519	305	234
13	325	80	0	86	0	0	0	0	0	0	0	76
>13	47	0	0	0	0	0	0	0	0	0	0	0

Table 46. Age-class composition of harvested and released walleye caught in trap nets in management area 4-5.

AGE	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
1	0	61462	1831	2774	3845	40781	2566	3904	855	12065
2	50385	31288	330989	12366	105482	108202	126290	10848	18596	22941
3	36284	90298	27198	131618	13832	93449	74903	59504	15784	17644
4	8970	15430	40066	6489	66159	9510	42338	20699	46588	7490
5	29132	4150	10195	7806	8113	22012	6727	15699	12818	20636
6	1417	8592	3911	1986	7021	2575	16884	2700	12141	10184
7	619	602	9184	2150	3415	2856	1556	7185	2130	8442
8	2161	911	820	3117	2364	801	2548	2237	8757	1930
9	1080	408	287	323	1209	1159	693	1479	2484	5876
10	1382	378	191	238	502	621	668	362	1308	650
11	410	18	342	144	171	158	160	623	581	237
12	326	244	96	238	0	0	0	519	305	234
13	0	86	0	0	0	0	0	0	0	76
>13	0	0	0	0	0	0	0	0	0	0

Table 47. CUE-at-age for walleye harvested in trap nets in management area 4-5.

AGE	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
1	0.14	0.50	0.00	0.52	0.26	0.10	0.13	0.12	0.84	0.88	0.14	2.06
2	2.65	8.90	8.13	5.25	29.45	1.12	10.27	17.23	16.17	2.50	5.87	5.73
3	39.14	3.35	13.00	27.80	5.27	54.17	4.65	31.13	30.05	26.69	7.79	7.33
4	1.66	21.61	3.70	5.18	11.24	2.98	29.50	3.58	23.60	10.00	23.04	3.18
5	1.38	1.31	12.93	1.42	2.73	3.61	3.64	8.97	3.75	7.67	6.36	8.80
6	1.17	0.76	0.63	2.95	1.19	0.92	3.15	1.05	8.07	1.33	6.02	4.34
7	0.33	0.82	0.27	0.21	2.63	0.99	1.53	1.16	0.87	3.54	1.06	3.60
8	0.63	0.12	0.96	0.31	0.25	1.44	1.06	0.33	1.42	1.10	4.34	0.82
9	0.63	0.47	0.48	0.14	0.09	0.15	0.54	0.47	0.39	0.73	1.23	2.50
10	0.55	0.19	0.61	0.13	0.06	0.11	0.23	0.25	0.37	0.18	0.65	0.28
11	0.16	0.41	0.18	0.01	0.10	0.07	0.08	0.06	0.09	0.31	0.29	0.10
12	0.04	0.09	0.14	0.08	0.03	0.11	0.00	0.00	0.00	0.26	0.15	0.03
13	0.12	0.03	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
>13	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Table 48. CUE-at-age (%/net) for harvested and released walleye in trap nets in management area 4-5.

AGE	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
1	0.0	21.2	0.6	1.3	1.7	16.6	1.4	1.9	0.4	5.1
2	22.4	10.8	100.3	5.7	45.3	44.1	70.4	5.3	9.2	9.8
3	16.1	31.1	8.2	60.8	5.9	38.1	41.8	29.5	7.8	7.5
4	4.0	5.3	12.1	3.0	28.4	3.9	23.6	10.2	23.1	3.2
5	12.9	1.4	3.1	3.6	3.6	9.0	3.7	7.7	6.4	8.8
6	0.6	3.0	1.2	0.9	3.2	1.1	9.4	1.3	6.0	4.3
7	0.3	0.2	2.8	1.0	1.53	1.2	0.9	3.5	1.1	3.6
8	1.0	0.3	0.3	1.4	1.1	0.3	1.4	1.1	4.3	0.8
9	0.5	0.1	0.1	0.2	0.5	0.5	0.4	0.7	1.2	2.5
10	0.6	0.1	0.1	0.1	0.2	0.3	0.4	0.2	0.7	0.3
11	0.2	0.0	0.1	0.1	0.1	0.1	0.1	0.3	0.3	0.1
12	0.1	0.1	0.0	0.1	0.0	0.0	0.0	0.3	0.2	0.1
13	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
>13	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1

LAKE TROUT/BACKCROSS

- Allocation remained unchanged at 37,096 kgs. Quota issued equalled allocation.
- Harvest increased 23% to 14,736 kgs, 40% of the allocation (Figure 57). Most of the harvest (96%) came from gill nets (Figure 58).
- No prediction concerning future abundance for 1992 or 1993.

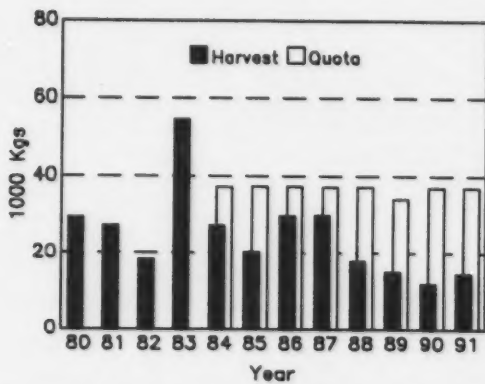


Figure 57. Lake trout/backcross harvest and quota (kgs) for management area 4-5.

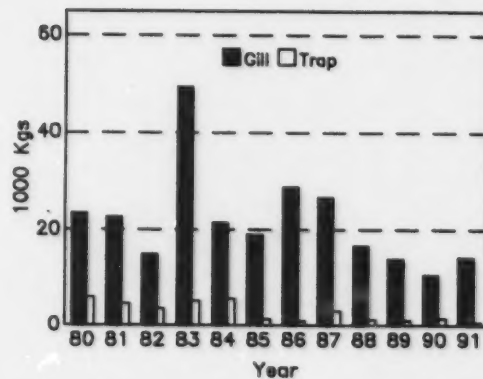


Figure 58. Lake trout/backcross harvest (kgs) for management area 4-5.

MANAGEMENT AREA 4-7**GENERAL**

- The total commercial fish allocation for all fish species under quota control increased 19% to 158,045 kg (Table 49), the result of increases in lake whitefish (29%) and chub (7%) allocations.
- Quota issued on commercial fish licences equalled the commercial fish allocation.
- Harvest of all fish species under quota control increased 19% to 113,716 kgs. Lake whitefish, one of the primary commercial fish species in this management area, accounted for the majority of the increase in harvest. Value of the harvest of species under quota control decreased 7% to \$226,462.
- Harvest and value of all fish species sold was 113,766 kgs and \$226,484 respectively (Table 50).

Table 49. Allocation, quota, harvest and percent quota taken by quota species for management area 4-7, 1991.

Species	Allocation (kgs)	Quota (kgs)	Harvest (kgs)	% Quota Taken
Channel Catfish	unlimited	unlimited	41	n/a
Chub	59141	59141	26283	44.4
Lake Sturgeon	0	0	0	0.0
Lake Trout	744	744	294	39.5
Lake Whitefish	95084	95084	86994	91.5
Northern Pike	225	225	0	0.0
Pink Salmon	819	819	0	0.0
Walleye	450	450	104	23.1
Yellow Perch	1582	1582	0	0.0
Total	158045	158045	113716	

Table 50. Value, harvest and catch by species for management area 4-7, 1991.

Species	Value (\$)	Harvest (kgs)	Catch (kgs)
Channel Catfish	27	41	41
Chub	52503	26283	26283
Lake Trout	961	294	294
Lake Whitefish	172632	86994	86994
Pacific Salmon	4	2	2
Round Whitefish	18	48	48
Walleye	339	104	104
Total	226484	113766	113766

LAKE WHITEFISH

- The allocation increased 29% to 95,084 kgs. Quota issued equalled the allocation.
- The harvest rose 21% to 86,994 kgs, 92% of the allocation (Figure 59).
- Gill net effort increased 26% to 393 kms (Figure 60).
- CUE decreased 4% to 222 kgs/km (Figure 61).
- Age 4 and 5 fish continue to dominate the fishery (Table 51).
- Although the contribution of the 1987 year-class was as strong as expected, overall abundance did not increase as predicted (Table 52).
- Abundance should remain at the current level in 1992 with continued recruitment of the 1987 year-class as age 5 fish. Although contribution of age 4 fish (1988 year-class) will be down from that of the previous two years, it will still be about average for the last decade (Figure 25, page 32). Due to the build up in biomass during the last three years, as a result of good-to-strong year-classes, abundance will remain high in 1993 even though recruitment is expected to drop.

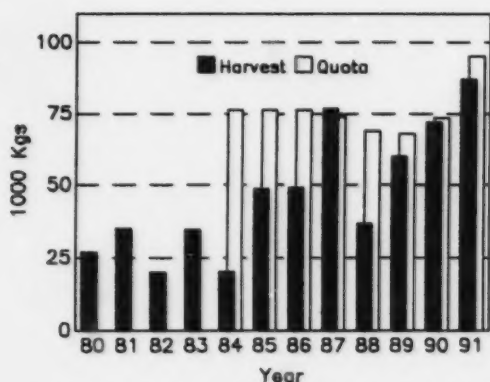


Figure 59. Lake whitefish harvest and quota (kgs) for management area 4-7.

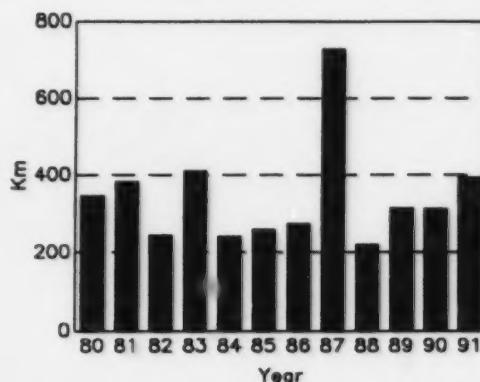


Figure 60. Lake whitefish annual gill net effort (km) for management area 4-7.

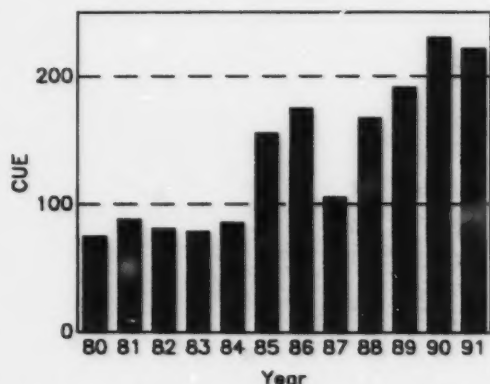


Figure 61. Lake whitefish gill net CUEs (kgs/km) for management area 4-7.

Table 51. Age-class composition of lake whitefish harvested in gill nets in management area 4-7.

AGE	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
1	0	0	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0	0	0
3	21411	788	1982	7295	1068	4378	1739	3275	5535	2564	0	1726
4	155	21914	2510	12709	9964	14961	32281	25361	6989	27519	20213	28745
5	1221	555	6278	1394	1327	11840	3602	18369	7461	7161	20213	23246
6	531	183	101	3535	132	1436	2227	4254	1818	1767	3032	8251
7	0	376	306	0	525	165	260	1423	718	1727	7075	2585
8	0	79	92	159	0	275	0	566	498	245	0	134
9	0	157	148	159	0	0	53	420	139	245	0	1315
10	0	23	92	0	0	0	0	20	61	122	0	438
11	78	183	0	0	0	0	0	20	0	122	0	0
12	0	0	0	0	0	0	0	44	0	122	0	0
13	78	0	0	0	0	0	0	0	0	0	0	0
>13	0	23	34	0	0	0	0	0	0	0	0	0

Table 52. CUE-at-age (number/km) for lake whitefish harvested in gill nets in management area 4-7.

AGE	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	47.81	2.28	5.19	29.96	2.60	18.19	6.71	11.95	7.60	11.71	0.00	4.39
4	0.35	63.34	6.58	52.19	24.27	62.16	124.59	92.56	9.60	125.66	64.79	73.20
5	2.73	1.60	16.45	5.72	3.23	49.19	13.90	67.04	10.25	32.70	64.79	59.19
6	1.19	0.53	0.26	14.52	0.32	5.97	8.60	15.53	2.50	8.07	9.72	21.01
7	0.00	1.09	0.80	0.00	1.28	0.69	1.00	5.19	0.99	7.89	22.68	6.58
8	0.00	0.23	0.24	0.65	0.00	1.14	0.00	2.07	0.68	1.12	0.00	0.34
9	0.00	0.45	0.39	0.65	0.00	0.00	0.20	1.53	0.19	1.12	0.00	3.35
10	0.00	0.07	0.24	0.00	0.00	0.00	0.00	0.07	0.08	0.56	0.00	1.12
11	0.17	0.53	0.00	0.00	0.00	0.00	0.00	0.07	0.00	0.56	0.00	0.00
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.16	0.00	0.56	0.00	0.00
13	0.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
>13	0.00	0.07	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

CHUB

- Allocation increased 7% to 59,141 kgs. Quota issued equalled allocation.
- Harvest increased 11% to 26,283 kgs, 44% of the allocation (Figure 62).
- Effort increased 7% to 288 kms (Figure 63).
- CUE increased to 148 kgs/kms (Figure 64). The discard component was 56 kgs/km.
- The strong 1983 and 1984 year-classes (ages 7,8) continue to support the fishery (Table 53).
- Abundance of harvestable chub changed little from 1990 as predicted. The abundance of discarded chub increased substantially from 1989.
- The weak 1985 through 1987 year-classes will begin to depress abundance in 1992. Although the large 1988 year-class will begin to enter the fishery in numbers in 1993, overall abundance will continue to decline. However, it should be recognized that chub stocks are at very high levels with resulting undesirable density effects on growth and sex ratios.

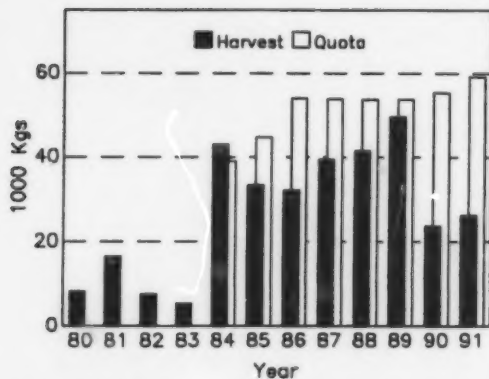


Figure 62. Chub harvest and quota (kgs) for management area 4-7.

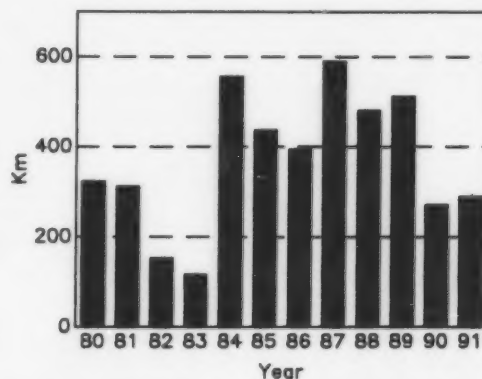


Figure 63. Chub annual gill net effort (km) for management area 4-7.

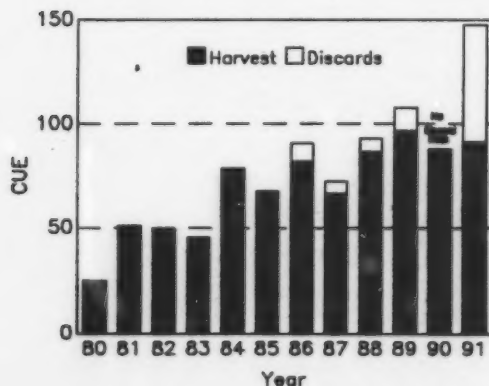


Figure 64. Annual chub (harvest + discards) gill net CUEs (kgs/km) for management area 4-7. CUEs corrected for discarding 1986 onward.

Table 53. Age-class composition of harvested and discarded chub in gill nets in management area 4-7.

AGE	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
1	0	0			0	0	0	0	0	0		0
2	747	677			0	0	0	0	0	0		0
3	18923	4477			4366	5448	165	658	0	0		0
4	8508	74427	N	N	19395	21872	8749	15574	8568	4521	N	0
5	5195	4528	O	O	41172	34150	35670	65130	58514	67272	O	8495
6	2995	364			82873	54067	64587	50107	98383	97011		38044
7	5240	1040	D	D	54050	43083	38237	62597	50403	67748	D	108137
8	2199	364	A	A	1141	10649	16517	25722	23990	9575	A	40641
9	0	0	T	T	2119	0	3401	15372	10784	0	T	10810
10	0	0	A	A	0	0	0	2870	1433	0	A	1299
11	0	0			0	0	422	301	0	0		0
12	0	0			0	0	0	603	0	0		0
13	0	0			0	0	0	187	0	0		0
>13	0	0			0	0	0	0	0	0		0

Note: corrected for discards 1987 onward.

Table 54. CUE-at-age (#/km) for harvested and discarded chub in gill nets in management area 4-7.

AGE	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
1	0.00	0.00			0.00	0.00	0.00	0.00	0.00	0.00		0.00
2	2.31	2.18			0.00	0.00	0.00	0.00	0.00	0.00		0.00
3	58.60	14.41			7.85	12.51	0.42	1.11	0.00	0.00		0.00
4	26.35	239.62	N	N	34.87	50.23	22.20	26.35	17.82	8.82	N	0.00
5	16.09	14.58	O	O	74.02	78.43	90.51	110.20	121.68	131.26	O	29.46
6	9.28	1.17			149.00	124.18	163.88	84.78	204.58	189.29		131.91
7	16.23	3.35	D	D	97.18	98.95	97.02	105.92	104.81	132.19	D	374.96
8	6.81	1.17	A	A	2.05	24.46	41.91	43.52	49.89	18.68	A	140.92
9	0.00	0.00	T	T	3.81	0.00	8.63	26.01	22.42	0.00	T	37.48
10	0.00	0.00	A	A	0.00	0.00	0.00	4.86	2.98	0.00	A	4.50
11	0.00	0.00			0.00	0.00	1.07	0.51	0.00	0.00		0.00
12	0.00	0.00			0.00	0.00	0.00	1.02	0.00	0.00		0.00
13	0.00	0.00			0.00	0.00	0.00	0.32	0.00	0.00		0.00
>13	0.00	0.00			0.00	0.00	0.00	0.00	0.00	0.00		0.00

Note: corrected for discards 1987 onward.

GEORGIAN BAY



GENERAL

- The total commercial fish allocation for all fish species under quota control increased slightly to 691,486 kgs (Table 55).
- Although additional experimental quota was issued on Georgian Bay, enough licences were not picked up to cause an effective decrease in total quota of 5% to 658,462 kgs.
- Harvest of all fish species under quota control increased 5% to 353,418 kgs. Value of the harvest of species under quota control decreased 13% to \$717,482.
- Harvest and value of all fish species sold was 377,870 kgs and \$738,332, respectively (Table 56). An additional 29,791 kgs of species of no commercial value were reported discarded.

Table 55. Allocation, quota, harvest and percent quota taken by quota species for Georgian Bay, 1991.

Species	Allocation (kgs)	Quota (kgs)	Harvest (kgs)	% Quota Taken
Channel Catfish	908	908	124	13.7
Chub	392765	376092	220899	58.7
Lake Sturgeon	1137	1137	124	10.9
Lake Trout	20182	15636	12548	80.3
Lake Whitefish	188600	183843	108096	58.8
Northern Pike	3686	3686	472	12.8
Pink Salmon	4355	4264	39	0.9
Walleye	9008	10732	4638	43.2
Yellow Perch	70845	62164	6478	10.4
Total	691486	658462	353418	

Table 56. Value, harvest and catch by species for Georgian Bay, 1991.

Species	Value (\$)	Harvest (kgs)	Catch (kgs)
Burbot	0	207	10100
Channel Catfish	109	124	238
Chub	396220	220899	220899
Common Carp	11161	10445	10710
Lake Herring	2988	3234	3357
Lake Sturgeon	349	124	133
Lake Trout	45014	12548	13021
Lake Whitefish	228685	108096	108229
Northern Pike	885	472	531
Pink Salmon	196	79	79
Rainbow Smelt	0	0	14
Rock Bass	0	0	50
Round Whitefish	6592	9581	9907
Suckers	0	927	17710
Walleye	19361	4638	4728
Yellow Perch	26772	6478	6523
Discarded (mixed)	0	18	1432
Total	738332	377870	407661

MANAGEMENT AREA 5-1**GENERAL**

- The total commercial fish allocation for all species under quota control remained unchanged at 86,066 kgs. However, not all licences were picked up resulting in an effective decrease in quota of 17% to 68,933 kgs.
- Harvest of all fish species under quota control increased 182% to 31,624 kgs (Table 57). Value of these fish decreased 142% to \$57,286.
- Harvest and value of all species sold was 40,895 kgs and \$63,274, respectively (Table 58). An additional 246 kgs of species of no commercial value were reported discarded.

Table 57. Allocation, quota, harvest and percent quota taken by quota species for management area 5-1, 1991.

Species	Allocation (kgs)	Quota (kgs)	Harvest (kgs)	% Quota Taken
Channel Catfish	0	0	2	*
Chub	17052	13654	9094	66.6
Lake Sturgeon	637	637	0	0.0
Lake Trout	2596	2596	1181	45.5
Lake Whitefish	35,522	28741	19056	66.3
Northern Pike	1759	1759	214	12.2
Pink Salmon	637	637	17	2.7
Walleye	1971	1971	633	32.1
Yellow Perch	25892	18938	1427	7.5
Total	86066	68933	31624	

* harvest without quota

Table 58. Value, harvest and catch by species for management area 5-1, 1991.

Species	Value (\$)	Harvest (kgs)	Catch (kgs)
Channel Catfish	1	2	2
Chub	16810	9094	9094
Common Carp	33	50	50
Lake Herring	179	267	267
Lake Trout	1681	1181	1187
Lake Whitefish	31930	19056	19056
Northern Pike	336	214	224
Pink Salmon	126	57	57
Round Whitefish	5688	8914	9087
Walleye	1761	633	690
Yellow Perch	4729	1427	1427
Total	63274	40895	41141

LAKE WHITEFISH

- The allocation remained unchanged at 35,222 kgs. However, not all licences were picked up resulting in an effective decrease in quota of 19% to 28,741 kgs.
- The harvest increased 155% to 19,056 kgs, 66% of the allocation (Figure 65).
- Gill net effort increased 240% to 357 kms (Figure 66).
- CUE decreased 25% to 53 kgs/km (Figure 67). Low fishing effort precludes using CUE as a reliable indicator of abundance.
- No prediction concerning future abundance in 1992 or 1993.

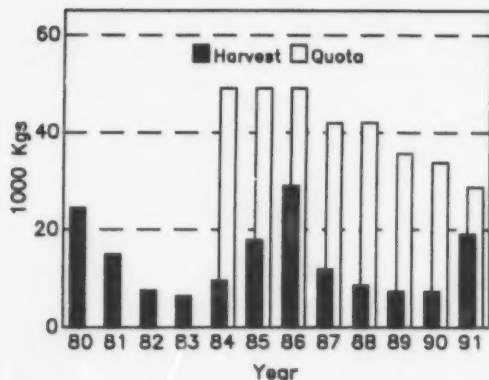


Figure 65. Lake whitefish harvest and quota (kgs) for management area 5-1.

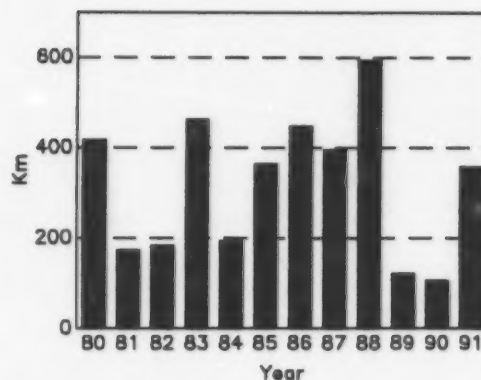


Figure 66. Lake whitefish annual gill net effort (km) for management area 5-1.

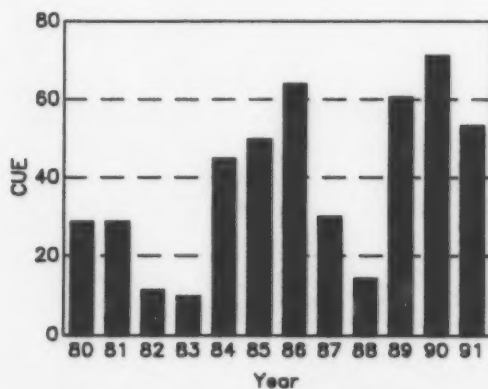


Figure 67. Lake whitefish gill net CUEs (kgs/km) for management area 5-1.

CHUB

- The allocation remained unchanged at 17,052 kgs. However, not all licences were picked up resulting in an effective decrease in quota of 20% to 13,654 kg.
- The harvest increased substantially to 9,094 kgs, 67% of the allocation (Figure 68).
- Effort increased to 144 kms (Figure 69).
- CUE (harvest) decreased 39% to 63 kgs/km (Figure 70).
- CUE is an unreliable indicator of abundance because of widely variable fishing effort.
- Without further information we cannot make any prediction concerning future abundance

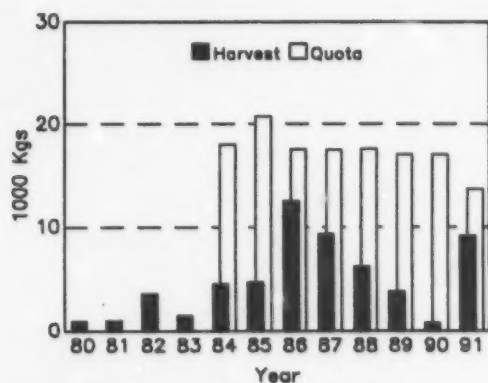


Figure 68. Chub harvest and quota (kgs) for management area 5-1 (GB01).

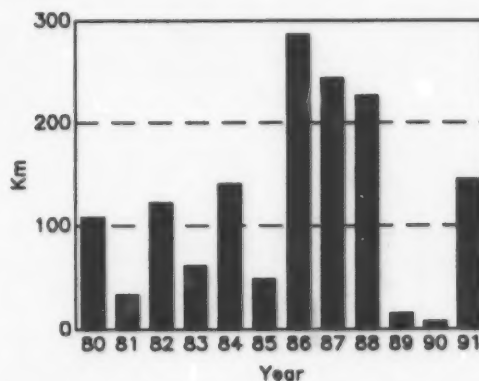


Figure 69. Chub annual gill net effort (km) for management area 5-1 (GB01).

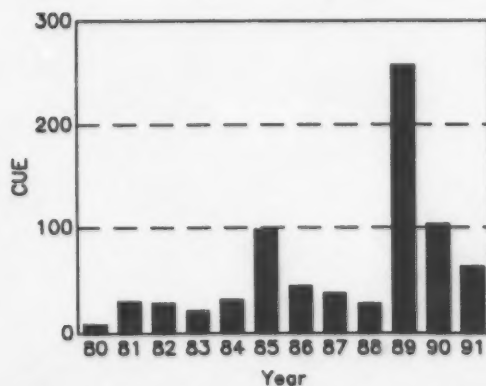


Figure 70. Chub annual gill net CUEs (kgs/km) for management area 5-1 (GB01).

YELLOW PERCH

- The allocation remained unchanged at 25,892 kgs. However, not all licences were picked up resulting in an effective decrease in quota of 24% to 18,938 kgs.
- The harvest increased 10% to 1,427 kgs, 8% of the allocation (Figure 71).
- Effort increased 75% to 63 km (Figure 72).
- CUE decreased 37% to 23 kgs/km (Figure 73).
- Unlikely that CUE is a reliable indicator of abundance due to minimal fishing effort.
- No prediction concerning future abundance.

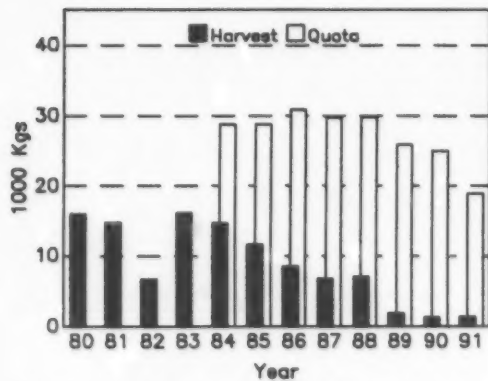


Figure 71. Yellow perch harvest and quota (kgs) for management area 5-1 (GB01).

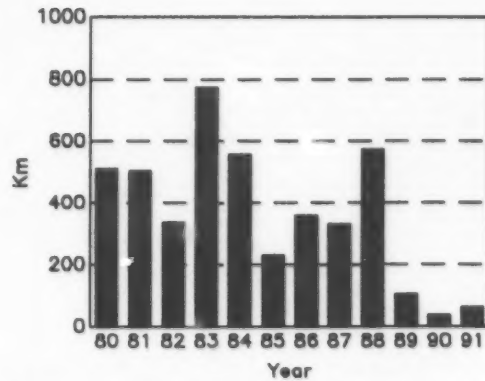


Figure 72. Yellow perch annual gill net effort (km) for management area 5-1 (GB01).

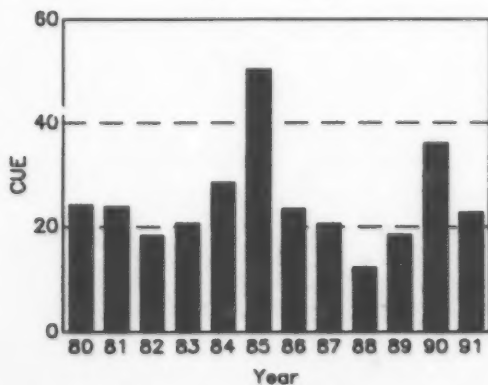


Figure 73. Yellow perch annual gill net CUEs (kgs/km) for management area 5-1 (GB01).

LAKE TROUT/BACKCROSS

- Allocation increased 5% to 2,596 kgs. Quota issued equalled the allocation.
- Harvest remained at 1,187 kgs, 46% of the allocation (Figure 74).
- No prediction concerning future abundance for 1992 or 1993.

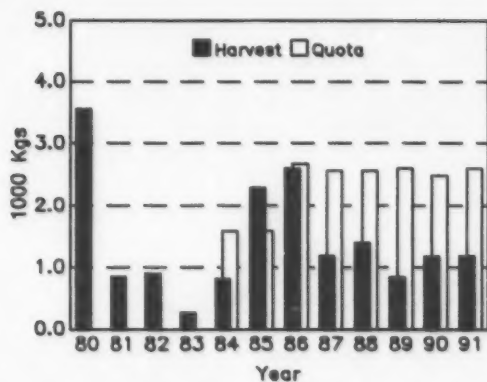


Figure 74. Lake trout/backcross harvest and quota (kgs) for management area 5-1.

MANAGEMENT AREA 5-2

**GENERAL**

- The total commercial fish allocation for all fish species under quota control remained unchanged at 46,244 kgs. Experimental fishing quotas were issued for lake whitefish, yellow perch and walleye which pushed the total quota to 132% of the base commercial allocation.
- Harvest of all fish species under quota control increased substantially to 18,129 kgs (Table 59). Value of these fish increased 362% to \$48,877.
- Harvest and value of all fish species sold was 21,400 kgs and \$51,329, respectively (Table 60).

Table 59. Allocation, quota, harvest and percent quota taken by quota species for management area 5-2, 1991.

Species	Allocation (kgs)	Quota (kgs)	Harvest (kgs)	% Quota Taken
Channel Catfish	0	0	0	0.0
Chub	20000	20000	3095	15.5
Lake Sturgeon	46	46	0	0.0
Lake Trout	0	0	0	0.0
Lake Whitefish	19096	31550	12278	38.9
Northern Pike	851	851	92	10.8
Pink Salmon	639	639	12	1.9
Walleye	4423	6192	2573	41.6
Yellow Perch	1189	1730	79	4.6
Total	46244	61008	18129	

Table 60. Value, harvest and catch by species for management area 5-2, 1991.

Species	Value (\$)	Harvest (kgs)	Catch (kgs)
Burbot	0	25	7025
Channel Catfish	0	0	14
Chub	7269	3095	3095
Common Carp	0	132	397
Lake Herring	2430	2427	2521
Lake Sturgeon	0	0	9
Lake Trout	0	0	136
Lake Whitefish	27683	12278	12411
Northern Pike	178	92	141
Pink Salmon	22	12	12
Rainbow Smelt	0	0	14
Rock Bass	0	0	9
Round Whitefish	22	26	26
Suckers	0	661	11306
Walleye	13401	2573	2606
Yellow Perch	324	79	79
Discarded (mixed)	0	0	208
Total	51329	21400	40009

LAKE WHITEFISH

- The allocation remained unchanged at 19,096 kgs. However, experimental fishing quota was issued which pushed total quota to 31,550 kgs, 165% of the allocation.
- The harvest increased dramatically to 12,278 kgs, 38.9% of the quota (Figure 75).
- Gill net effort increased to 90 kms (Figure 76).
- CUE increased 68% to 138 kgs/km (Figure 77). Low fishing effort precludes using CUE as a reliable indicator of abundance.
- No prediction concerning future abundance in 1992 or 1993.

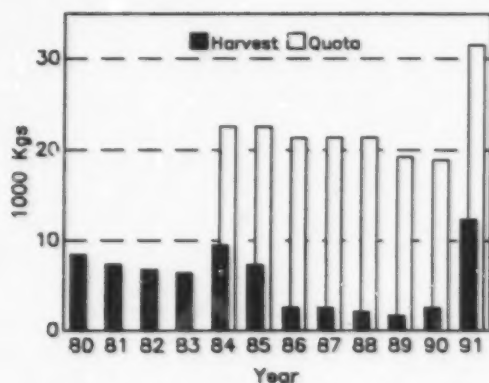


Figure 75. Lake whitefish harvest and quota (kgs) for management area 5-2.

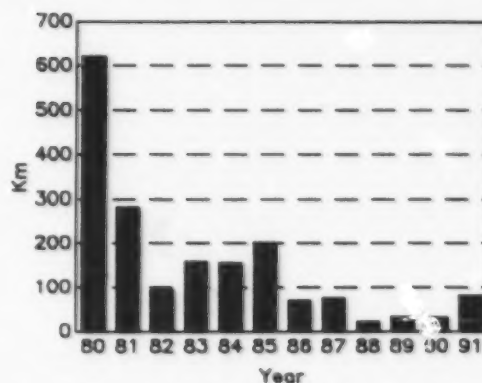


Figure 76. Lake whitefish annual gill net effort (km) for management area 5-2.

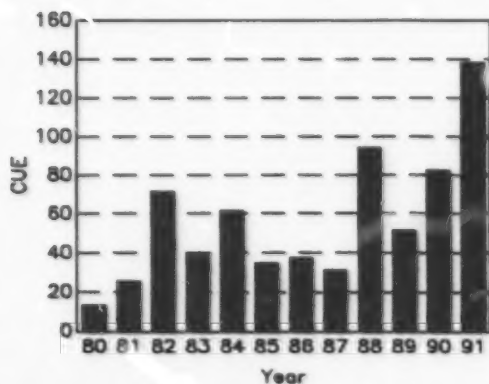


Figure 77. Lake whitefish annual gill net CUEs (kgs/km) for management area 5-2.

CHUB

- The allocation remained unchanged at 20,000 kgs. Quota issued equalled the allocation.
- The harvest increased to 3095 kgs, 16% of the allocation (Figure 78).
- Effort increased to 38 km (Figure 79).
- CUE (harvest) increased 31% to 82 kgs/km (Figure 80).
- CUE is an unreliable indicator of abundance because of widely variable fishing effort.
- Without further information we cannot make any prediction concerning future abundance.

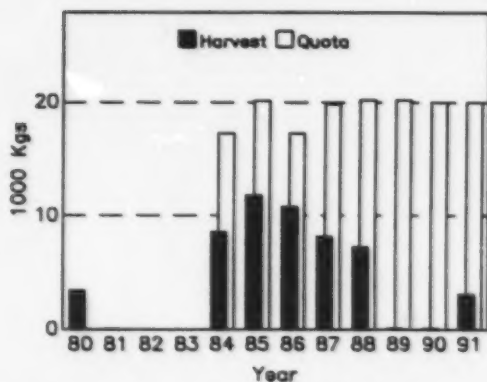


Figure 78. Chub harvest and quota (kgs) for management area 5-2.

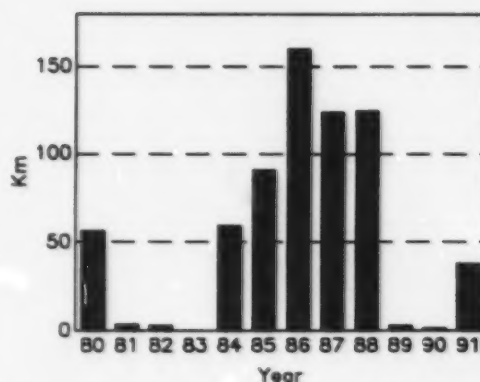


Figure 79. Chub annual gill net effort (km) for management area 5-2.

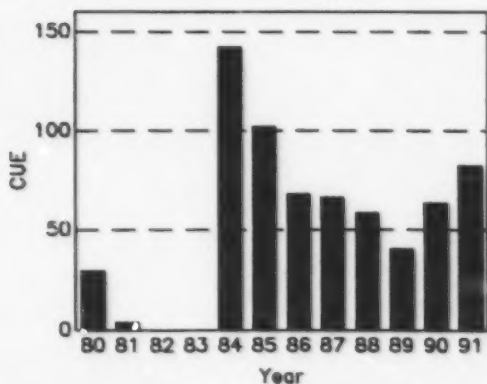


Figure 80. Chub annual gill net CUEs (kgs/km) for management area 5-2.

YELLOW PERCH

- The allocation remained unchanged at 1,189 kgs. However, experimental fishing quota was issued which pushed the total quota to 1,730kgs, 146% of the allocation.
- Harvest was 79 kgs, 5% of the quota (Figure 81).
- Effort was 3 km (Figure 82).
- CUE was 24 kgs/km (Figure 83).
- No prediction concerning future abundance for 1992 or 1993.

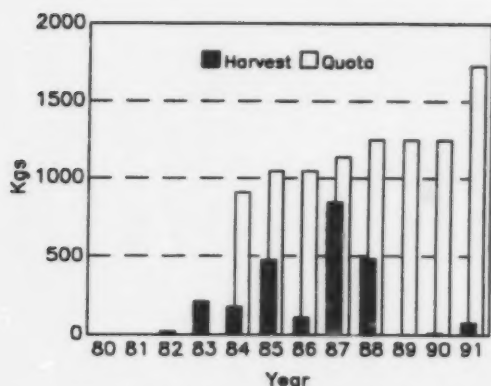


Figure 81. Yellow perch harvest and quota (kgs) for management area 5-2.

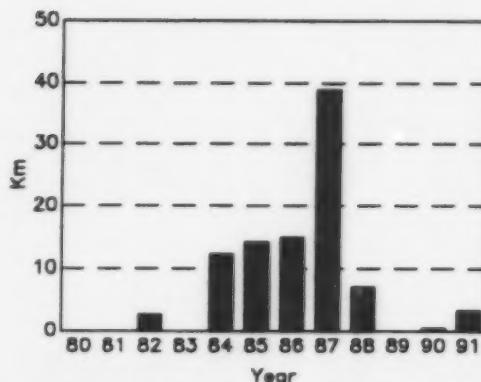


Figure 82. Yellow perch annual gill net effort (km) for management area 5-2.

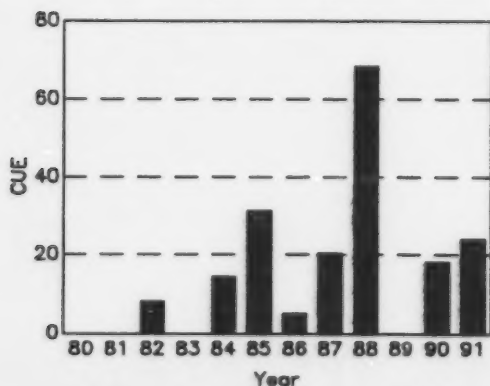


Figure 83. Yellow perch annual gill net CUEs (kgs/km) for management area 5-2.

WALLEYE

- The allocation remained unchanged at 4,423 kgs. However, experimental fishing quota was issued which pushed the total quota to 6,192 kgs, 140% of the allocation.
- The harvest increased 130% to 2,606 kgs (Figure 84).
- CUE decreased 24% to 36 kgs/km (Figure 85)
- CUE is an unreliable indicator of abundance due to minimal fishing effort.
- No prediction concerning future abundance.

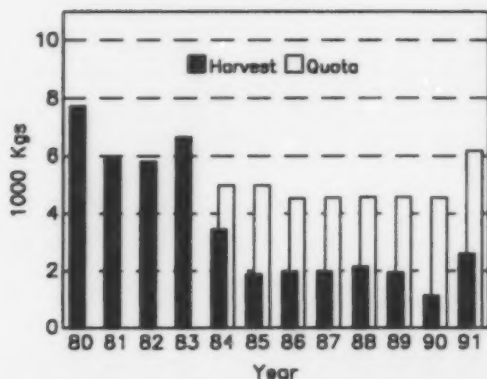


Figure 84. Walleye harvest and quota (kgs) for management area 5-2.

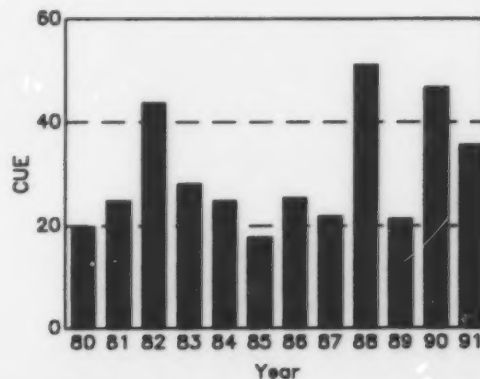
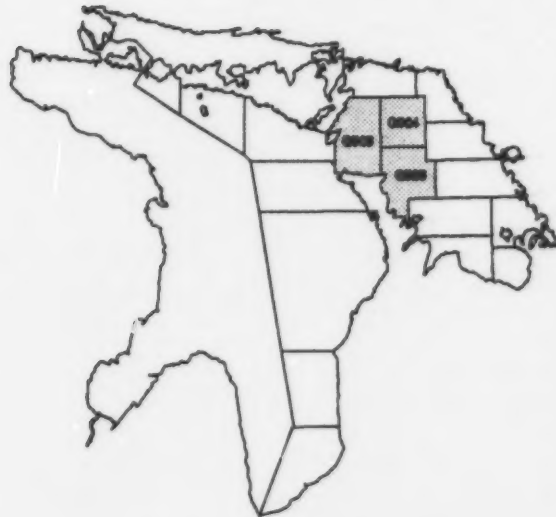


Figure 85. Walleye annual gill net CUEs (kgs/km) for management area 5-2.

MANAGEMENT AREA 5-3



GENERAL

- The total commercial fish allocation for all species under quota control increased slightly (3%) to 250,049 kgs. Quotas issued equalled the allocation.
- Harvest of all fish species under quota control decreased 10% to 124,080 kg (Table 61). Value of these fish decreased 7% to \$239,612.
- Harvest and value of all species sold was 124,303 kgs and \$239,713, respectively (Table 62). An additional 1,150 kgs of fish of limited commercial value was discarded.

Table 61. Allocation, quota, harvest and percent quota taken by quota species for management area 5-3, 1991.

Species	Allocation (kgs)	Quota (kgs)	Harvest (kgs)	% Quota Taken
Channel Catfish	908	908	0	0.0
Chub	204286	204286	110254	54.0
Lake Sturgeon	0	0	0	0.0
Lake Trout	2820	2820	1305	46.3
Lake Whitefish	36066	36066	12487	34.6
Northern Pike	446	446	0	0.0
Pink Salmon	998	998	0	0.0
Walleye	0	0	0	0.0
Yellow Perch	4525	4525	34	0.8
Total	250049	250049	124080	

Table 62. Value, harvest and catch by species for management area 5-3, 1991.

Species	Value (\$)	Harvest (kgs)	Catch (kgs)
Burbot	0	0	1105
Chub	211215	110254	110254
Lake Herring	47	159	159
Lake Trout	4057	1305	1305
Lake Whitefish	24200	12487	12487
Round Whitefish	54	64	64
Yellow Perch	140	34	79
Total	239713	124303	125453

LAKE WHITEFISH

- The allocation increased 2% to 36,066 kgs. Quota issued equalled the allocation.
- The harvest decreased by 5% to 12,487 kgs, 35% of the allocation (Figure 86). Most of the harvest came from area GB03 (83%) (Figure 87).
- Gill net effort increased 15% to 100 kms (Figure 88).
- CUE in GB03 decreased 22% to 123 kgs/km (Figure 89).
- Abundance did not increase as one would expect based on the pre-recruit indices from southern Georgian Bay.
- No prediction concerning future abundance in 1992 or 1993.

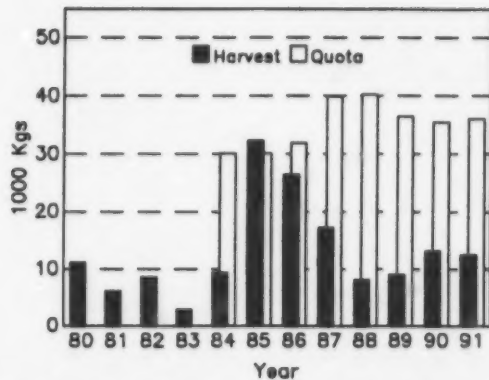


Figure 86. Lake whitefish harvest and quota (kgs) for management area 5-3.

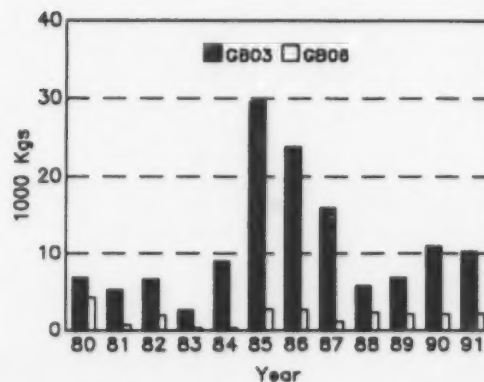


Figure 87. Lake whitefish harvest (kgs) by subarea for management area 5-3.

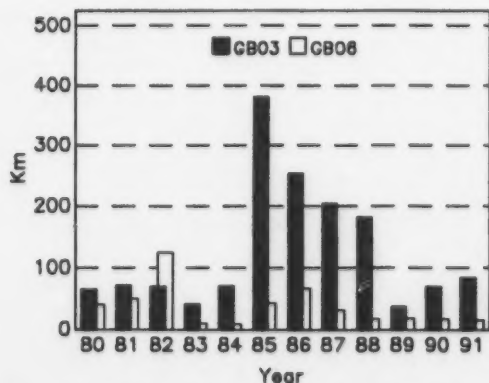


Figure 88. Lake whitefish gill net effort (km) by subarea for management area 5-3.

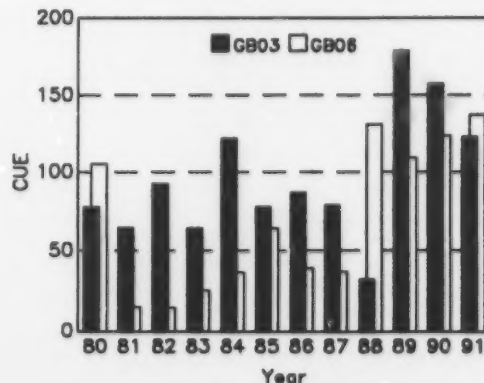


Figure 89. Lake whitefish annual gill net CUEs (kgs/km) by subarea for management area 5-3.

CHUB

- Allocation increased 3% to 204,286 kgs. Quota issued equalled the allocation.
- Harvest decreased 11% to 110,254 kgs, 54% of the allocation (Figure 90). Most of the harvest came from areas GB03 (45%) and GB06 (51%) (Figure 91).
- Effort remained at 1567 km (Figure 92).
- The management area CUE of harvested chub decreased 11%, primarily the result of a decrease in CUE in assessment area GB06 (Figure 93). Although the CUE of harvested chub increased in assessment area GB03 the overall CUE of harvested and discarded chub dropped by 5% to 127 kgs/km (Figure 94).
- Age 7 and 8 fish contributed substantially to the catch as predicted (Table 63). The contribution of age 5 and 6 fish dropped as predicted (Table 63).
- Abundance had been predicted to remain unchanged in 1991. Although the abundance of harvested chub did increase, the abundance of discarded chub decreased as weak year-classes entered the fishery (Table 64).
- Abundance will decline in 1992 and 1993 as the weaker year-classes (1986 and 1987) continue to replace strong year-classes (1983 and 1984) in the fishery (Figure 95). The strong 1988 year-class will not have an effect on the fishery until 1994.

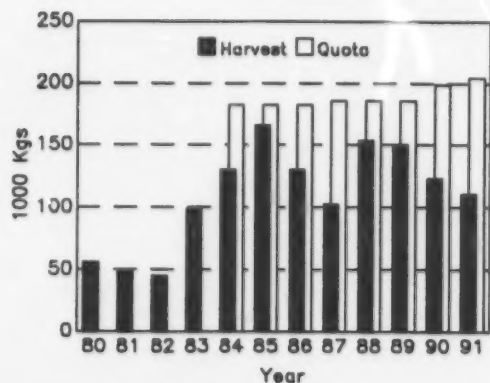


Figure 90. Chub harvest and quota (kgs) for management area 5-3.

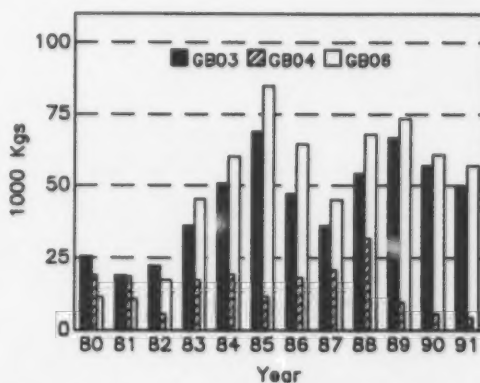


Figure 91. Chub harvest (kgs) by subarea for management area 5-3.

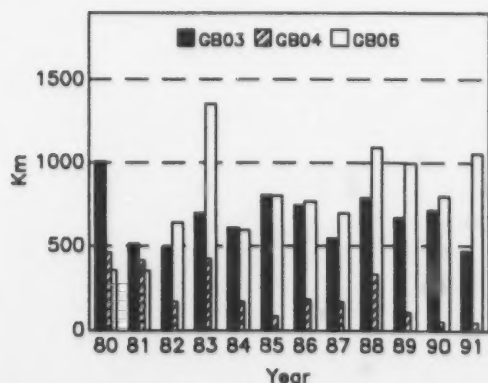


Figure 92. Chub annual gill net effort (km) by subarea for management area 5-3.

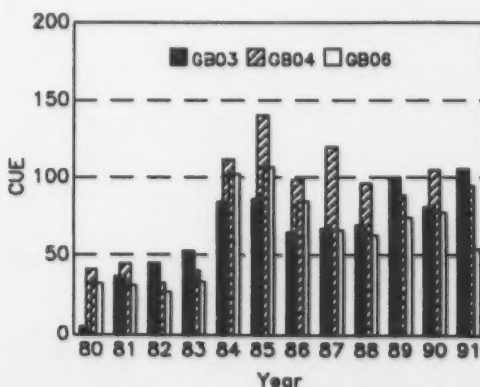


Figure 93. Chub annual gill net CUEs (kgs/km) by subarea for management area 5-3.

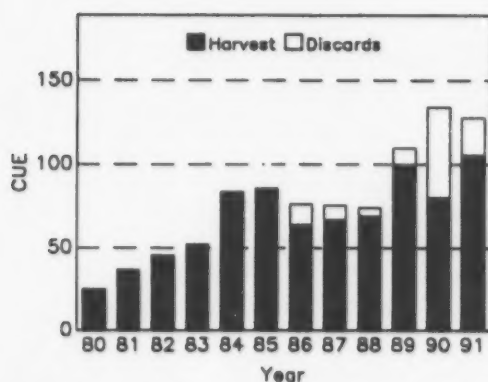


Figure 94. Annual chub (harvest + discards) gill net CUEs (kgs/km) for GB03 (sub-area of management area 5-3). Corrected for discarding 1986 onward.

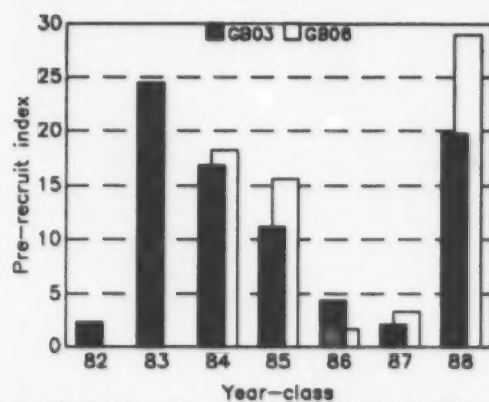


Figure 95. Indices of year-class strength for chub from index gillnetting in assessment areas GB03 and GB06 (subareas of management area 5-3).

Table 63. Age-class composition of harvested and discarded chub in gill nets in assessment area GB03 (subarea of management area 5-3).

AGE	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
1	0	0	0		0	0	0	0	0	0	0	0
2	0	3226	0		0	0	0	1048	0	0	0	0
3	8484	38353	6554		4982	392	3758	2549	890	0	1329	41
4	57010	36784	59413	N	67691	28634	4443	22282	23626	2751	5204	3536
5	19725	47299	28949	O	83916	96600	84131	40537	126273	74651	49416	9580
6	17282	3075	22809		49807	122345	90723	98439	70060	196624	199377	45004
7	14686	4465	4670	D	18029	51514	21242	37317	61781	44621	189677	119558
8	2802	2606	1369	A	5292	14704	13641	5411	16473	14005	24887	56802
9	2469	755	228	T	1708	3468	917	1291	2951	2657	8502	12960
10	925	755	0	A	1146	221	1124	0	219	0	452	2405
11	0	1716	0		0	221	917	0	99	628	0	1307
12	617	0	492		0	0	0	514	0	0	452	0
13	309	0	0		0	0	0	0	0	0	0	0
>13	309	0	0		0	0	0	0	0	0	0	0

Note: corrected for discards 1987 onward.

Table 64. CUE-at-age (#/km) for harvested and discarded chub in gill nets in assessment area GB03 (subarea of management area 5-3).

AGE	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
1	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.00	6.29	0.00		0.00	0.00	0.00	1.93	0.00	0.00	0.00	0.00
3	8.41	74.75	13.32		8.19	0.49	5.07	4.70	1.14	0.00	1.88	0.90
4	56.52	71.69	120.71	N	111.32	35.69	6.00	41.11	30.15	4.13	7.36	7.58
5	19.56	92.18	58.82	O	138.00	120.39	113.58	74.79	161.12	112.12	69.85	20.54
6	17.13	5.99	46.34		81.91	152.47	122.48	181.62	89.40	295.32	281.80	96.47
7	14.56	8.70	9.49	D	29.65	64.20	28.68	68.85	78.83	67.02	268.09	256.29
8	2.78	5.08	2.78	A	8.70	18.33	18.42	9.98	21.02	21.03	35.18	121.76
9	2.45	1.47	0.46	T	2.81	4.32	1.24	2.38	3.77	3.99	12.02	27.78
10	0.92	1.47	0.00	A	1.88	0.28	1.52	0.00	0.28	0.00	0.64	5.16
11	0.00	3.34	0.00		0.00	0.28	1.24	0.00	0.13	0.94	0.00	2.80
12	0.61	0.00	1.00		0.00	0.00	0.00	0.95	0.00	0.00	0.64	0.00
13	0.31	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
>13	0.31	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Note: corrected for discards 1987 onward.

YELLOW PERCH

- Allocation increased to 4,525 kgs.
- Harvest was 79 kgs, 2% of the allocation (Figure 96).
- No prediction concerning future abundance for 1992 or 1993.

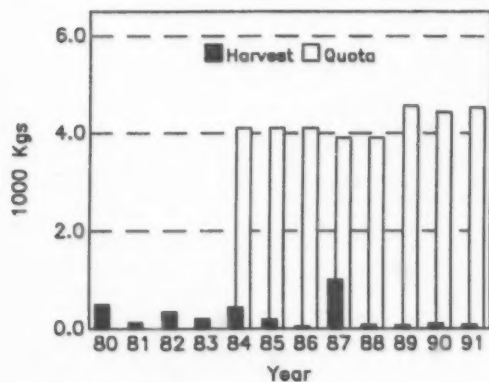


Figure 96. Yellow perch harvest and quota (kgs) for management area 5-3.

LAKE TROUT/BACKCROSS

- The allocation increased 4% to 2,820 kgs. Quota issued equalled the allocation.
- The harvest increased to 1,304 kgs, 46% of the allocation (Figure 97). Harvest by assessment area is given in Figure 98.
- The overall management area CUE increased (Figure 99).
- No prediction concerning future abundance for 1992 or 1993.

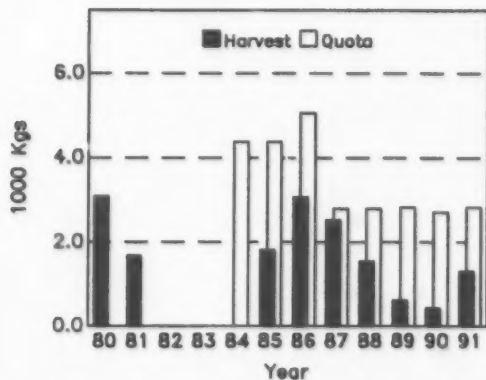


Figure 97. Lake trout/backcross harvest and quota (kgs) for management area 5-3.

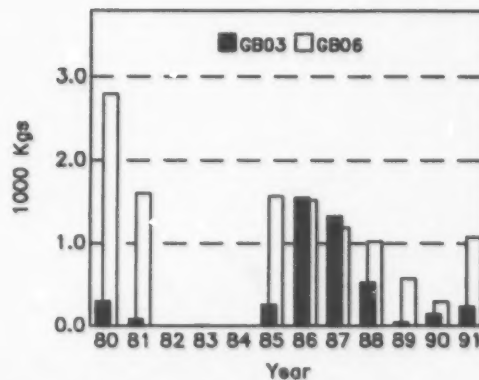


Figure 98. Lake trout/backcross harvest (kgs) by subarea for management area 5-3.

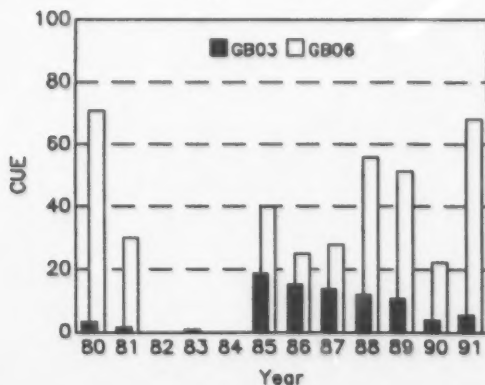


Figure 99. Lake trout/backcross annual gill net CUEs (kgs/km) by subarea for management area 5-3.

MANAGEMENT AREA 5-4



GENERAL

- The total commercial fish allocation for all species under quota control remained at 30,763 kgs. Quotas issued equalled the allocation.
- Harvest of all fish species under quota control increased 127% to 7,975 kg (Table 65). Value of these fish decreased 50% to \$16,497.
- Harvest and value of all species sold was 8,147 kgs and \$16,699, respectively (Table 66). An additional 402 kgs of fish of limited commercial value was discarded.

Table 65. Allocation, quota, harvest and percent quota taken by quota species for management area 5-4, 1991.

Species	Allocation (kgs)	Quota (kgs)	Harvest (kgs)	% Quota Taken
Channel Catfish	0	0	0	0.0
Chub	18000	18000	3140	17.4
Lake Sturgeon	0	0	0	0.0
Lake Trout	0	0	0	0.0
Lake Whitefish	6538	6538	4220	64.5
Northern Pike	0	0	0	0.0
Pink Salmon	360	360	0	0.0
Walleye	159	159	69	43.4
Yellow Perch	5706	5706	546	9.6
Total	30763	30763	7975	

Table 66. Value, harvest and catch by species for management area 5-4, 1991.

Species	Value (\$)	Harvest (kgs)	Catch (kgs)
Burbot	0	0	157
Chub	4913	3140	3140
Lake Herring	64	38	56
Lake Whitefish	8863	4220	4220
Round Whitefish	138	122	134
Suckers	0	1	44
Walleye	311	69	69
Yellow Perch	2410	546	546
Discarded (mixed)	0	11	183
Total	16699	8147	8549

LAKE WHITEFISH

- The allocation remained unchanged at 6,538 kgs. Quotas issued equalled the allocation.
- The harvest increased 109% to 4,220 kgs, 64% of the allocation (Figure 100).
- Gill net effort increased 168% to 56 kms (Figure 101).
- CUE decreased 22% to 75 kgs/km (Figure 102).
- Low fishing effort precludes using CUE as a reliable indicator of abundance. No appreciable change in this stock.
- Abundance did not increase as one would expect based on the pre-recruit indices from southern Georgian Bay.
- No prediction concerning future abundance in 1992 or 1993.

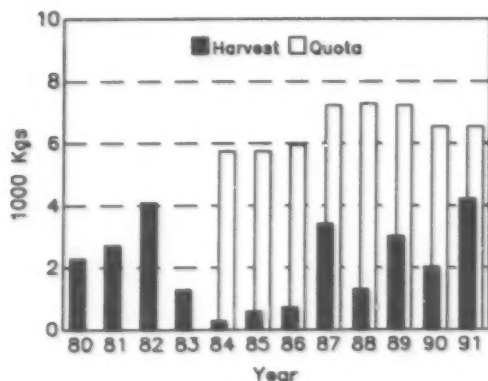


Figure 100. Lake whitefish harvest and quota (kgs) for management area 5-4.

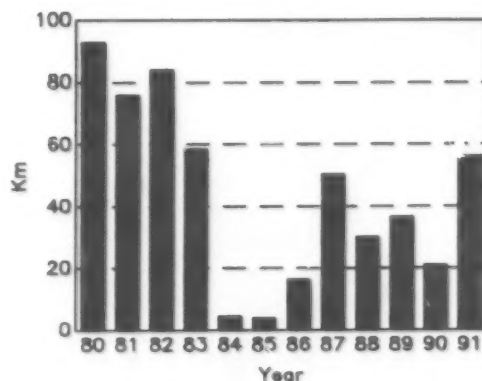


Figure 101. Lake whitefish annual gill net effort (km) for management area 5-4.

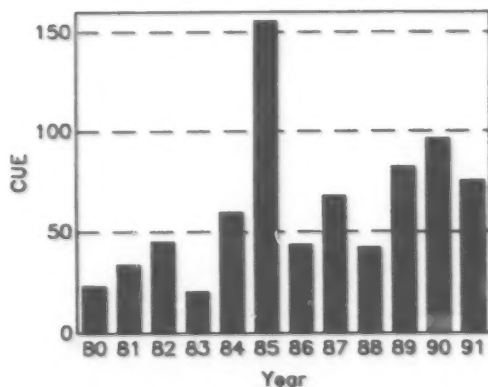


Figure 102. Lake whitefish annual gill net CUEs (kgs/km) for management area 5-4.

CHUB

- Allocation remained constant at 18,000 kgs. Quota issued equalled the allocation.
- Harvest was 3,140 kgs, 17% of the allocation (Figure 103).
- Effort was 37 km (Figure 104).
- CUE increased to 86 kgs/km (Figure 105).
- CUE is an unreliable indicator of abundance due to widely variable fishing effort.
- Without further information we cannot make any prediction concerning future abundance.

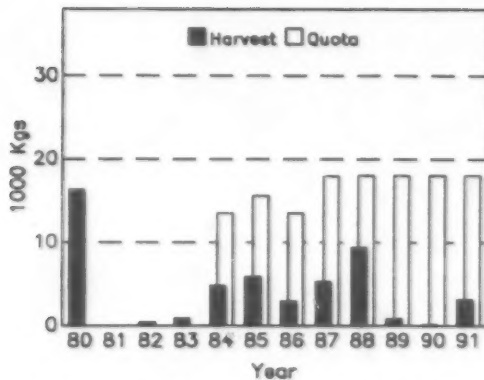


Figure 103. Chub harvest and quota (kgs) for management area 5-4.

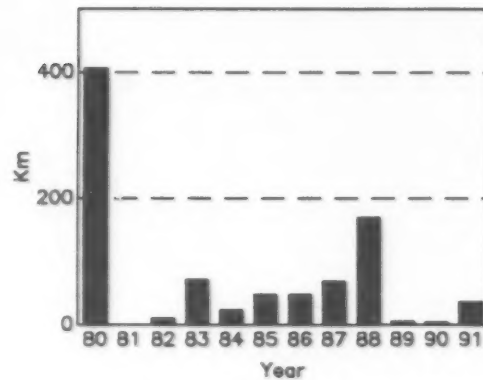


Figure 104. Chub annual gill net effort (km) for management area 5-4.

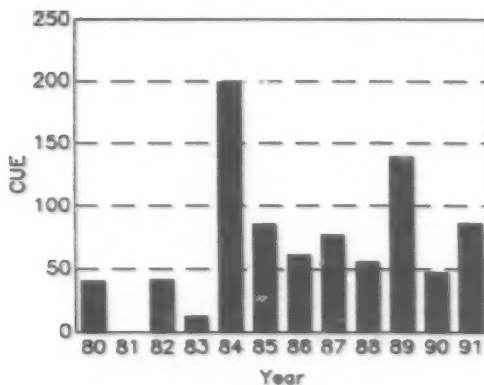


Figure 105. Chub annual gill net CUEs (kgs/km) for management area 5-4.

YELLOW PERCH

- Allocation remained at 5,706 kgs. Quota issued equalled the allocation.
- Harvest decreased 57% to 546 kgs, 10% of the allocation (Figure 106).
- Effort decreased 5% to 17 km (Figure 107).
- CUE decreased 55% to 32 kgs/km (Figure 108).
- No prediction concerning future abundance for 1992 or 1993.

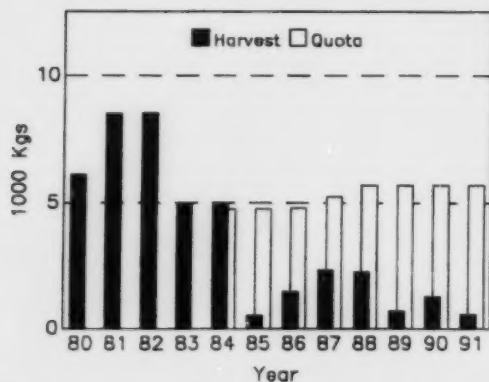


Figure 106. Yellow perch harvest and quota (kgs) for management area 5-4.

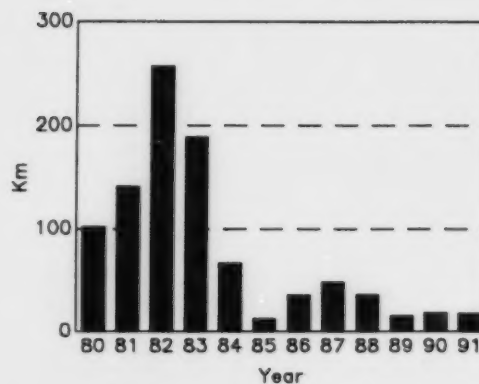


Figure 107. Yellow perch annual gill net effort (km) for management area 5-4.

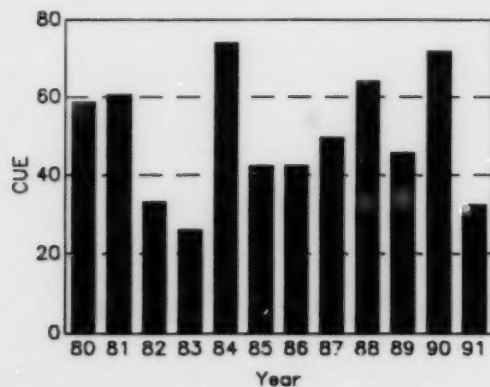


Figure 108. Yellow perch annual gill net CUEs (kgs/km) for management area 5-4.

MANAGEMENT AREA 5-5



GENERAL

- The total commercial fish allocation for all species under quota control remained at 59,117 kgs. Quotas issued equalled the allocation.
- Harvest of all fish species under quota control increased 82% to 27,557 kg (Table 67). Value of these fish increased 41% to \$57,704.
- Harvest and value of all species sold was 27,996 kgs and \$58,358, respectively (Table 68). An additional 208 kgs of fish of limited commercial value was discarded.

Table 67. Allocation, quota, harvest and percent quota taken by quota species for management area 5-5, 1991.

Species	Allocation (kgs)	Quota (kgs)	Harvest (kgs)	% Quota Taken
Channel Catfish	0	0	0	0.0
Chub	34364	34364	19481	56.7
Lake Sturgeon	0	0	0	0.0
Lake Trout	0	0	0	0.0
Lake Whitefish	11353	11353	5914	52.1
Northern Pike	0	0	0	0.0
Pink Salmon	272	272	0	0.0
Walleye	0	0	0	0.0
Yellow Perch	13128	13128	2162	16.5
Total	59117	59117	27557	

Table 68. Value, harvest and catch by species for management area 5-5, 1991.

Species	Value (\$)	Harvest (kgs)	Catch (kgs)
Chub	36374	19481	19481
Lake Herring	0	11	22
Lake Whitefish	11984	5914	5914
Round Whitefish	664	421	426
Yellow Perch	9346	2162	2162
Discarded (mixed)	0	7	199
Total	58368	27996	28204

LAKE WHITEFISH

- The allocation remained unchanged at 11,353 kgs. Quota issued equalled the allocation.
- The harvest increased by 16% to 5,914 kgs, 52% of the allocation (Figure 109).
- Gill net effort increased 84% to 100 kms (Figure 110).
- CUE decreased 37% to 59 kgs/km (Figure 111).
- Abundance did not increase as predicted. It is questionable whether or not the pre-recruit indices from southern Georgian Bay are applicable to this area.
- No prediction concerning abundance in 1992 or 1993.

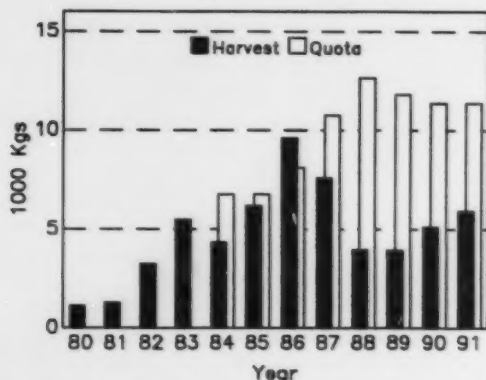


Figure 109. Lake whitefish harvest and quota (kgs) for management area 5-5.

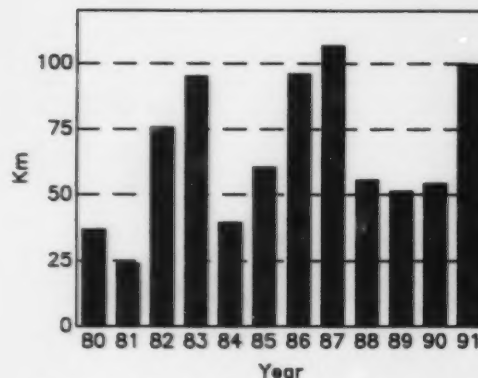


Figure 110. Lake whitefish annual gill net effort (km) for management area 5-5.

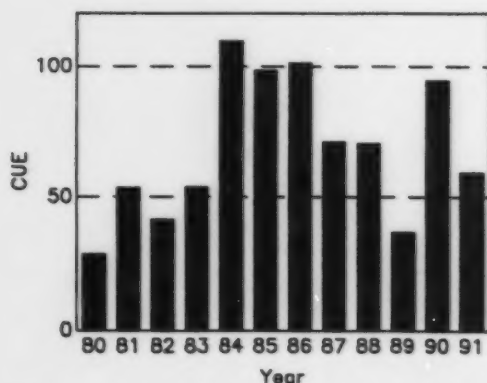


Figure 111. Lake whitefish annual gill net CUEs (kgs/km) for management area 5-5.

CHUB

- Allocation increased 4% to 34,364 kgs. Quota issued equalled the allocation.
- Harvest increased to 19,481 kgs, 57% of the allocation (Figure 112).
- Effort increased to 281 km (Figure 113).
- CUE increased slightly (4)% to 69 kgs/km (Figure 114).
- CUE is an unreliable indicator of abundance due to widely variable fishing effort.
- Without further information we cannot make any prediction concerning future abundance.

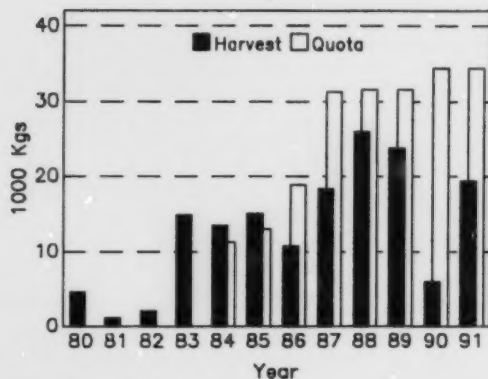


Figure 112. Chub harvest and quota (kgs) for management area 5-5.

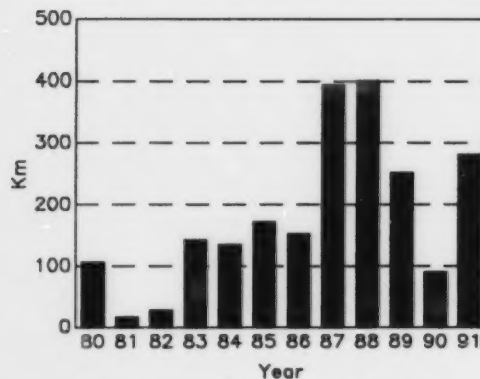


Figure 113. Chub annual gill net effort (km) for management area 5-5.

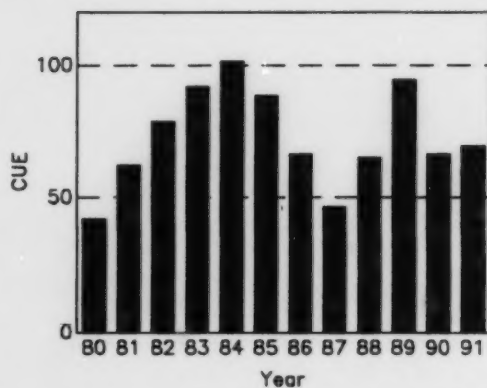


Figure 114. Chub annual gill net CUEs (kgs/km) for management area 5-5.

YELLOW PERCH

- Allocation remained unchanged at 13,128 kgs. Quota issued equalled the allocation.
- Harvest decreased 47% to 2,162 kgs, 16% of the allocation (Figure 115).
- Effort increased 16% to 65 km (Figure 116).
- CUE decreased 54% to 33 kgs/km (Figure 117).
- No prediction concerning future abundance for 1992 or 1993.

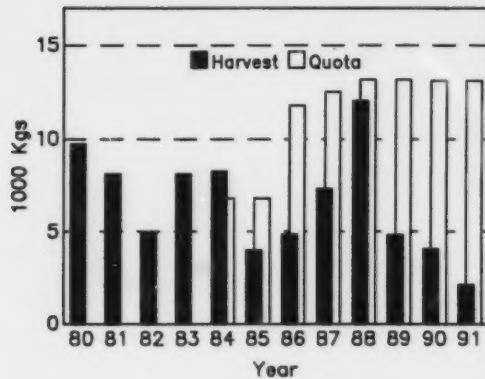


Figure 115. Yellow perch harvest and quota (kgs) for management area 5-5.

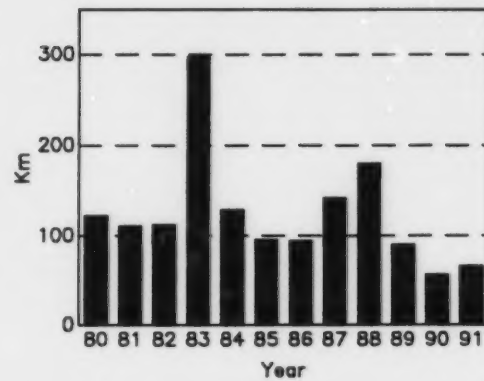


Figure 116. Yellow perch annual gill net effort (km) for management area 5-5.

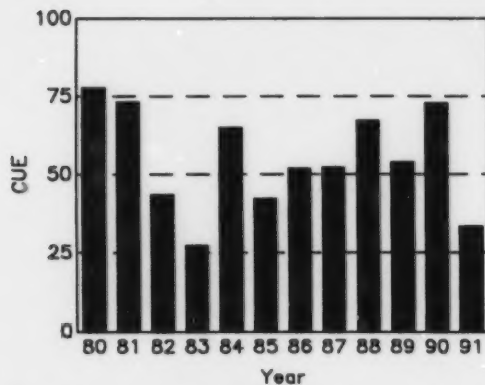


Figure 117. Yellow perch annual gill net CUEs (kgs/km) for management area 5-5.

MANAGEMENT AREA 5-6



GENERAL

- The total commercial fish allocation for all species under quota control declined 4% to 81,752 kgs. Quota effectively decreased 44% to 47,217 kg as a result of some licences not being picked up.
- The reported harvest of all fish species under quota control apparently decreased 17% to 49,260 kg (Table 69). Value of these fish decreased 41% to \$55,838.
- Harvest and value of all species sold was 40,820 kgs and \$55,838, respectively (Table 70). An additional 156 kgs of fish of limited commercial value was reported discarded.
- It should be noted that the harvest and value tables were produced by summarizing the information supplied by licenced commercial fisherman on their monthly fishing reports. They do not include the undocumented harvest from the substantial native fishery in this area.

Table 69. Allocation, quota, harvest and percent quota taken by quota species for management area 5-6, 1991.

Species	Allocation (kgs)	Quota (kgs)	Harvest (kgs)	% Quota Taken
Channel Catfish	0	0	0	0.0
Chub	59345	46070	40664	88.3
Lake Sturgeon	0	0	0	0.0
Lake Trout	4558	12	0	0.0
Lake Whitefish	14718	408	155	38.0
Northern Pike	0	0	0	0.0
Pink Salmon	545	454	0	0.0
Walleye	45	0	0	0.0
Yellow Perch	2541	273	0	0.0
Total	81752	47217	40819	

Table 70. Value, harvest and catch by species for management area 5-6, 1991.

Species	Value (\$)	Harvest (kgs)	Catch (kgs)
Chub	55450	40664	40664
Lake Whitefish	388	155	155
Discarded (mixed)	0	1	157
Total	55838	40820	40976

LAKE WHITEFISH

- The allocation declined 10% to 14,718 kgs. However, not all licences were picked up resulting in an effective decrease in quota to 408 kgs.
- The reported harvest decreased to 155 kgs (Figure 118). However, a substantial native fishery harvests lake whitefish in this area.
- Effort and CUE data are of questionable value and therefore not included.
- Pre-recruit indices in southern Georgian Bay are indicating a trend towards higher abundance (Figure 135, page 109).
- No prediction concerning future abundance in 1992 and 1993.

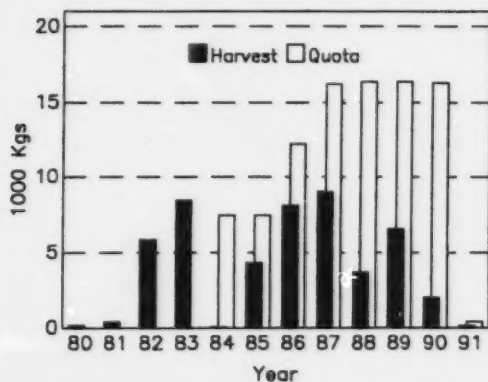


Figure 118. Lake whitefish harvest and quota (kgs) for management area 5-6.

CHUB

- Allocation decreased 24% to 46,070 kgs. Quota issued equalled the allocation.
- Harvest decreased 7% to 40,664 kgs, 88% of the allocation (Figure 119).
- Effort increased 19% to 419 km (Figure 120).
- CUE (harvest + discards) decreased 23% to 107 kgs/km (Figure 121). The discard component increased 42% to 10 kgs/km.
- Age 6 and 7 fish dominated the catch (Table 71).
- Abundance unexpectedly declined because the continued recruitment of the strong 1984 year-class (age 7) did not compensate for the poor contribution of the weaker 1985 and 1986 year-classes (Table 72).
- Abundance will decline in 1992 and 1993 as weaker year-classes (1986 and 1987) replace the strong 1983 and 1984 year-classes (Figure 95, page 82; Figure 139, page 110). The strong 1988 year-class will not have an effect on the fishery until 1994.

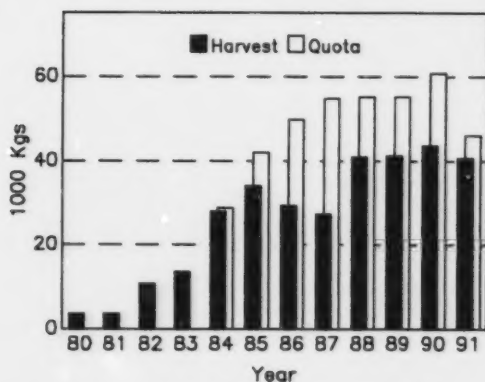


Figure 119. Chub harvest and quota (kgs) for management area 5-6.

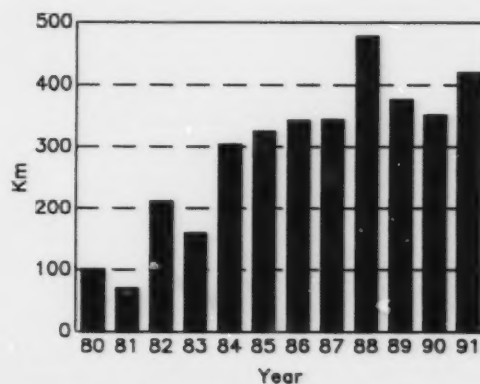


Figure 120. Chub annual gill net effort (km) for management area 5-6.

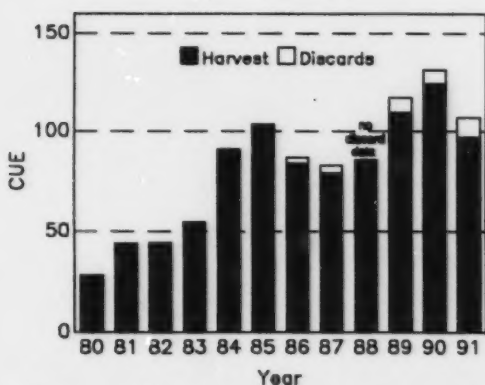


Figure 121. Chub annual gill net CUEs (kgs/km) (harvest + discards) for management area 5-6.

Table 71. Age-class composition of harvested and discarded chub in gill nets in management area 5-6.

AGE	1984	1985	1986	1987	1988	1989	1990	1991
1	0	0	0	0		0	0	0
2	343	0	179	0		0	0	0
3	6622	8033	7638	2210		443	0	562
4	30017	31615	41468	29808	N	2443	10305	0
5	55081	54193	58224	36532	O	41014	39465	17737
6	18309	49025	29569	47555		149560	172400	78659
7	7827	10348	1583	16390	D	16469	101598	82799
8	2292	1712	82	4900	A	7460	11570	26169
9	1554	823	0	296	T	2819	2665	540
10	1848	0	0	0	A	0	0	0
11	173	1364	0	0		0	0	0
12	471	0	0	0		0	0	0
13	0	0	0	0		0	0	0
>13	0	0	0	0		0	0	0

Note: corrected for discards 1987 onward.

Table 72. CUE-at-age (#/km) for harvested and discarded chub in gill nets in management area 5-6.

AGE	1984	1985	1986	1987	1988	1989	1990	1991
1	0.00	0.00	0.00	0.00		0.00	0.00	0.00
2	1.13	0.00	0.52	0.00		0.00	0.00	0.00
3	21.80	24.68	22.30	6.41		1.18	0.00	1.34
4	98.84	97.13	121.07	86.45	N	6.49	29.27	0.00
5	181.37	166.49	170.00	105.95	O	109.02	112.08	42.33
6	60.29	150.61	86.33	137.92		397.55	489.63	187.73
7	25.77	31.79	4.62	47.53	D	43.78	288.55	197.61
8	7.55	5.26	0.24	14.21	A	19.83	32.86	62.46
9	5.12	2.53	0.00	0.86	T	7.49	7.57	1.29
10	6.08	0.00	0.00	0.00	A	0.00	0.00	0.00
11	0.57	4.19	0.00	0.00		0.00	0.00	0.00
12	1.55	0.00	0.00	0.00		0.00	0.00	0.00
13	0.00	0.00	0.00	0.00		0.00	0.00	0.00
>13	0.00	0.00	0.00	0.00		0.00	0.00	0.00

Note: corrected for discards 1987 onward.

LAKE TROUT/BACKCROSS

- Allocation was unchanged at 4,558 kgs. Not all licences were picked up resulting in an effective decrease in quota to 0 kgs.
- The reported harvest decreased to 12 kgs (Figure 122). However, a substantial native fishery harvests lake trout/backcross in this area.
- No prediction concerning future abundance for 1992 or 1993.

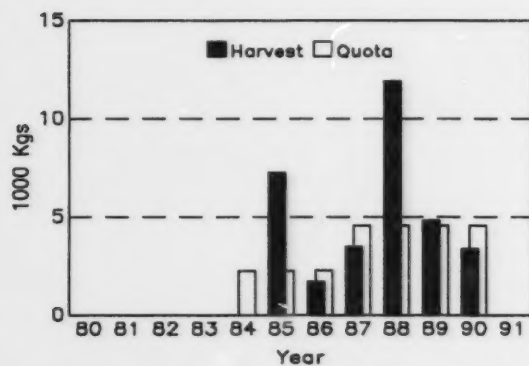


Figure 122. Lake trout/backcross harvest and quota (kgs) for management area 5-6.

MANAGEMENT AREA 5-7



GENERAL

- The total commercial fish allocation for all species under quota control remained at 38,765 kgs. Quotas issued equalled the allocation.
- Harvest of all fish species under quota control decreased 20% to 20,063 kg (Table 73). Value of these fish decreased 24% to \$44,449.
- Harvest and value of all species sold was 30,459 kgs and \$55,784, respectively (Table 74). An additional 1914 kgs of fish of limited commercial value was discarded.

Table 73. Allocation, quota, harvest and percent quota taken by quota species for management area 5-7, 1991.

Species	Allocation (kgs)	Quota (kgs)	Harvest (kgs)	% Quota Taken
Channel Catfish	unlimited	unlimited	118	n/a
Chub	11592	11592	10102	87.1
Lake Sturgeon	318	318	84	26.4
Lake Trout	745	745	208	27.9
Lake Whitefish	14618	14618	5828	39.9
Northern Pike	630	630	166	26.3
Pink Salmon	543	543	0	0.0
Walleye	1590	1590	1329	83.6
Yellow Perch	8729	8729	2228	25.5
Total	38765	38765	20063	

Table 74. Value, harvest and catch by species for management area 5-7, 1991.

Species	Value (\$)	Harvest (kgs)	Catch (kgs)
Burbot	0	1	321
Channel Catfish	105	118	218
Chub	17833	10102	10102
Common Carp	11128	10169	10169
Lake Herring	206	246	246
Lake Sturgeon	208	84	84
Lake Trout	829	208	208
Lake Whitefish	11610	5828	5828
Northern Pike	371	166	166
Rock Bass	0	0	41
Round Whitefish	1	3	139
Suckers	0	0	637
Walleye	3675	1329	1329
Yellow Perch	9818	2228	2228
Discarded (mixed)	0	0	657
Total	55784	30459	32373

LAKE WHITEFISH

- The allocation increased 2% to 14,618 kgs. Quota issued equalled the allocation.
- The harvest decreased by 10% to 5,828 kgs, 40% of the allocation (Figure 123).
- Gill net effort decreased 63% to 34 kms (Figure 124).
- CUE increased by 142% to 174 kgs/km (Figure 125).
- Much of the apparent increase in abundance is probably an artifact of low effort.
- Pre-recruit indices in southern Georgian Bay are indicating a trend towards higher abundance (Figure 135, page 109).

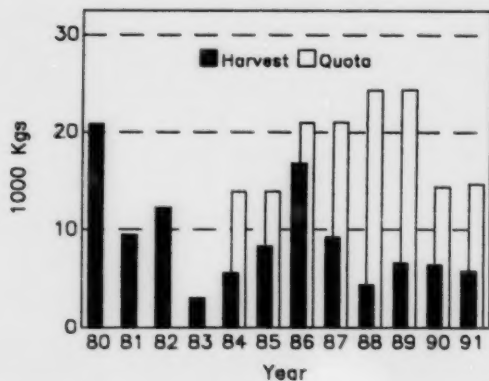


Figure 123. Lake whitefish harvest and quota (kgs) for management area 5-7.

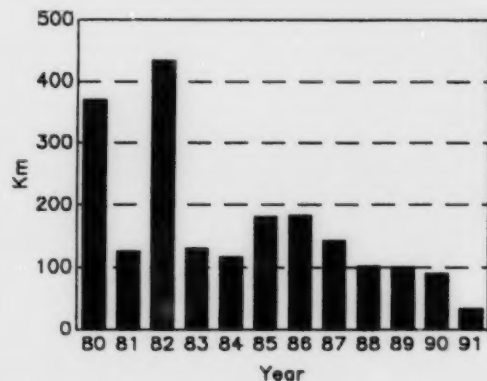


Figure 124. Lake whitefish annual gill net effort (km) for management area 5-7.

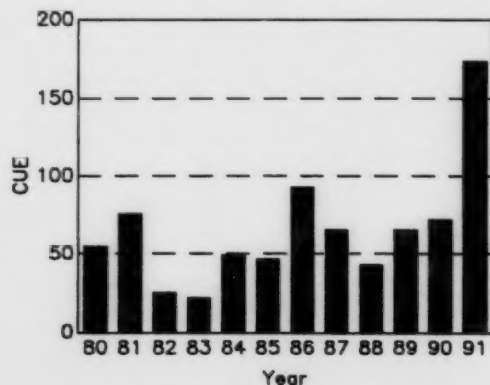


Figure 125. Lake whitefish annual gill net CUEs (kgs/km) for management area 5-7.

CHUB

- Allocation remained unchanged at 11,592 kgs. Quota issued equalled the allocation.
- Harvest decreased 10% to 10,102 kgs, 87% of the allocation (Figure 126).
- Effort decreased 13% to 85 km (Figure 127).
- CUE increased 3% to 119 kgs/km (Figure 128).
- Abundance remained virtually unchanged.
- Abundance should decrease in 1992 and 1993 as weaker year-classes (1986 and 1987) replace the strong 1983 and 1984 year-classes which are believed to have supported the fishery (Figure 95, page 82; Figure 139, page 110).

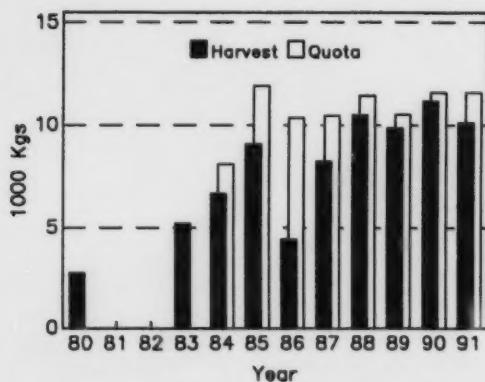


Figure 126. Chub harvest and quota (kgs) for management area 5-7.

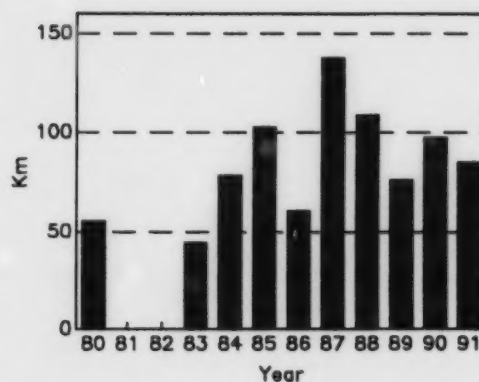


Figure 127. Chub annual gill net effort (km) for management area 5-7.

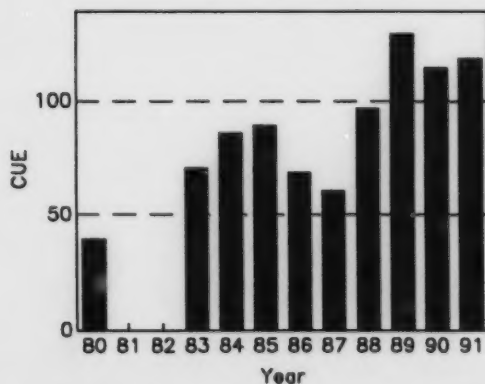


Figure 128. Chub annual gill net CUEs (kgs/km) for management area 5-7.

YELLOW PERCH

- Allocation remained unchanged at 8729 kgs. Quota issued equalled the allocation.
- Harvest decreased 47% to 2,228 kgs, 26% of the allocation (Figure 129).
- Effort decreased 50% to 33 km (Figure 130).
- CUE increased 7% to 68 kgs/km (Figure 131).
- CUE is an unreliable indicator of abundance because of widely variable fishing effort.
- No prediction concerning future abundance for 1992 or 1993.

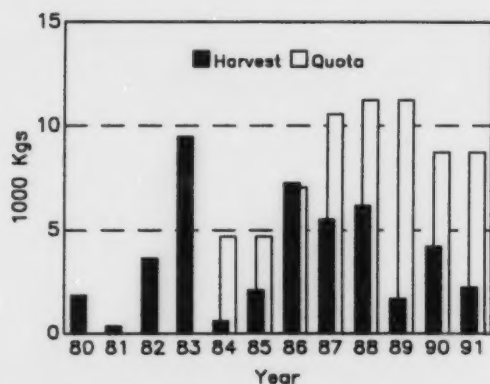


Figure 129. Yellow perch harvest and quota (kgs) for management area 5-7.

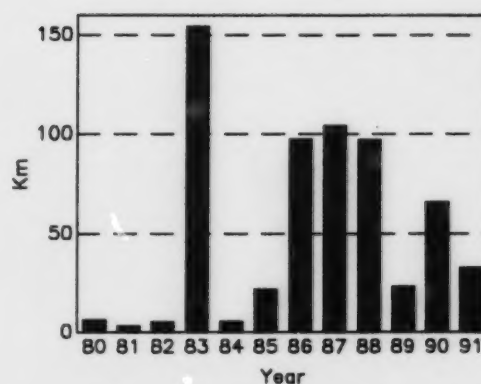


Figure 130. Yellow perch annual gill net effort (km) for management area 5-7.

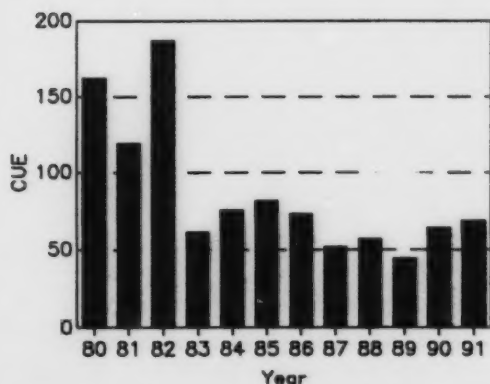


Figure 131. Yellow perch annual gill net CUEs (kgs/km) for management area 5-7.

MANAGEMENT AREA 5-8**GENERAL**

- The total commercial fish allocation increased 3% to 35,042 kgs, the result of a 10% increase in the lake white-fish allocation.
- Quota issued on commercial fish licences equalled the commercial fish allocation.
- Harvest of all fish species under quota control increased 10% to 32,647 kgs (Table 75). Value of these fish increased 12% to \$76,510.
- Harvest and value of all species sold was 32,648 kgs and \$76,510, respectively (Table 76).

Table 75. Allocation, quota, harvest and percent quota taken by quota species for management area 5-8, 1991.

Species	Allocation (kgs)	Quota (kgs)	Harvest (kgs)	% Quota Taken
Channel Catfish	0	0	0	0.0
Chub	18168	18168	17905	98.6
Lake Sturgeon	0	0	0	0.0
Lake Trout	4536	4536	5125	113.0
Lake Whitefish	9979	9979	9617	96.4
Northern Pike	0	0	0	0.0
Pink Salmon	91	91	0	0.0
Walleye	0	0	0	0.0
Yellow Perch	2268	2268	0	0.0
Total	35042	35042	32647	

Table 76. Value, harvest and catch by species for management area 5-8, 1991.

Species	Value (\$)	Harvest (kgs)	Catch (kgs)
Chub	32729	17905	17905
Lake Trout	19739	5125	5456
Lake Whitefish	24042	9617	9617
Discarded (mixed)	0	1	28
Total	76510	32648	33006

LAKE WHITEFISH

- The allocation increased 10% to 9,979 kgs. Quota issued equalled the allocation.
- The harvest increased by 17% to 9,617 kgs, 96% of the allocation (Figure 132).
- Gill net effort increased 14% to 45 kms (Figure 133).
- CUE increased by 3% to 214 kgs/km (Figure 134).
- Preliminary commercial catch sampling indicates that the increase in abundance resulted from the recruitment of the strong 1987 year-class. The 1988 year-class did not enter the fishery to the extent expected.
- Abundance will increase in 1992 as the 1988 year-class recruits at age 4. The equally strong 1989 year-class will increase abundance in 1993 (Figure 135).

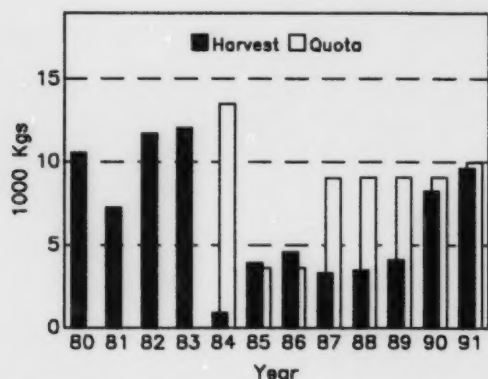


Figure 132. Lake whitefish harvest and quota (kgs) for management area 5-8.

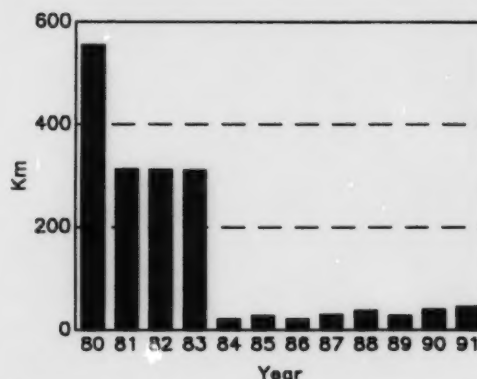


Figure 133. Lake whitefish annual gill net effort (km) for management area 5-8.

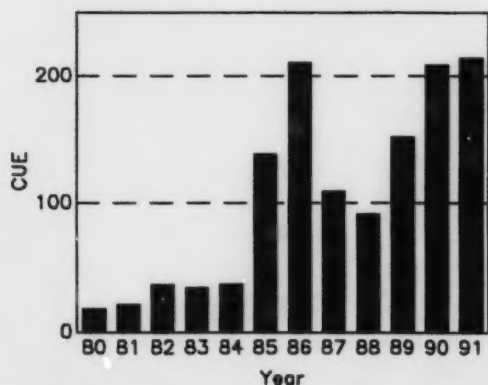


Figure 134. Lake whitefish annual gill net CUEs (kgs/km) for management area 5-8.

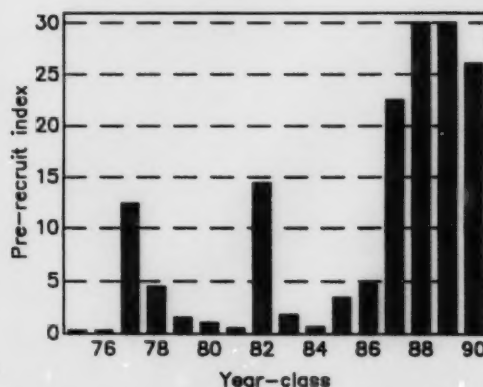


Figure 135. Indices of year-class strength for lake whitefish from index gillnetting in management area 5-8.

CHUB

- Allocation remained unchanged at 18,168 kgs. Quota issued equalled the allocation.
- Harvest increased 6% to 17,905 kgs, 99% of the allocation (Figure 136).
- Effort increased 36% to 214 km (Figure 137).
- CUE decreased 23% to 84 kgs/km (Figure 138).
- Preliminary commercial catch sampling indicates that the bulk of the catch is composed of ages 6, 7, 8.
- Abundance declined as predicted, likely the result of the diminishing presence of the 1983 year-class in the fishery.
- Abundance is expected to continue to decline in 1992 and 1993 as weak year-classes enter the fishery (Figure 139). The strong 1988 year-class will not have an effect on the fishery until 1994.

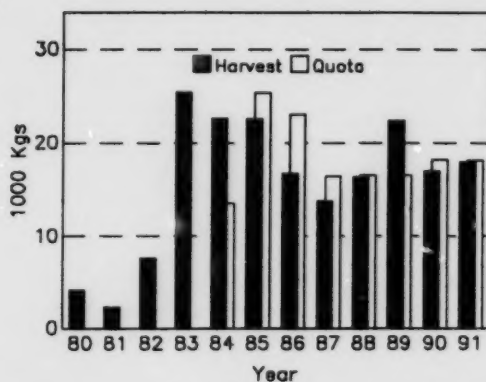


Figure 136. Chub harvest and quota (kgs) for management area 5-8.

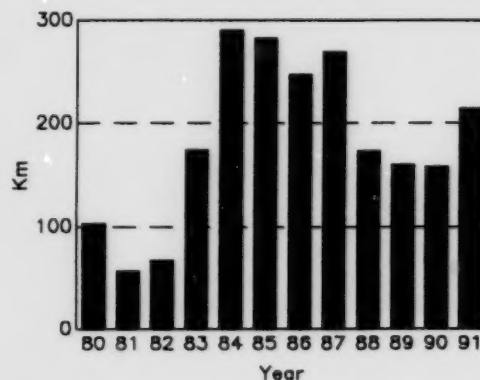


Figure 137. Chub annual gill net effort (km) for management area 5-8.

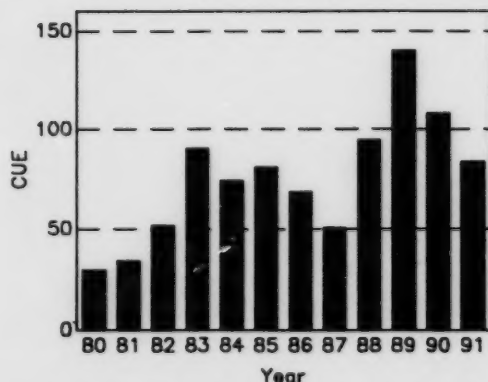


Figure 138. Chub annual gill net CUEs (kgs/km) for management area 5-8.

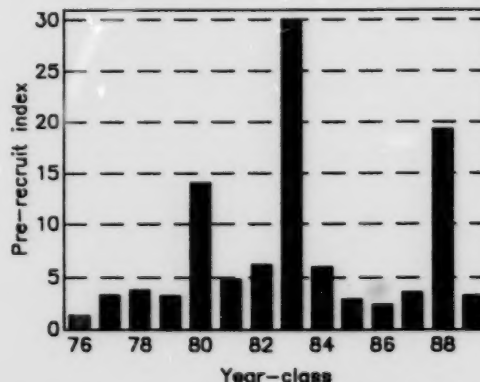


Figure 139. Indices of year-class strength for chub from index gillnetting in management area 5-8.

LAKE TROUT/BACKCROSS

- Allocation was unchanged at 4,536 kgs. Quota issued equalled the allocation.
- The harvest increased 22% to 5,456 kgs, 120% of the allocation (Figure 140).
- Effort increased 24% to 45 km (Figure 141).
- CUE decreased 1% to 122 kgs/km (Figure 142).
- Total mortality rates above age 4 remain over 60%, above the recommended 40% guideline.

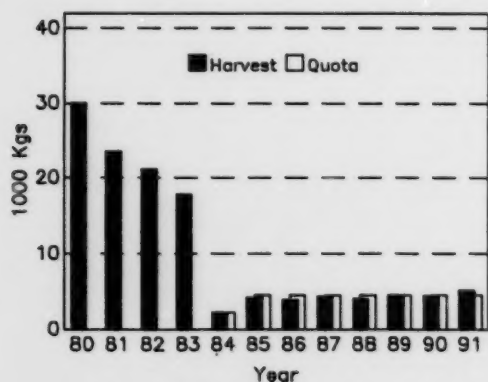


Figure 140. Lake trout/backcross harvest and quota (kgs) for management area 5-8.

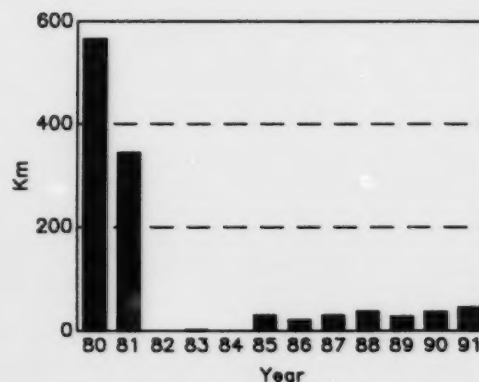


Figure 141. Lake trout/backcross annual gill net effort (km) for management area 5-8.

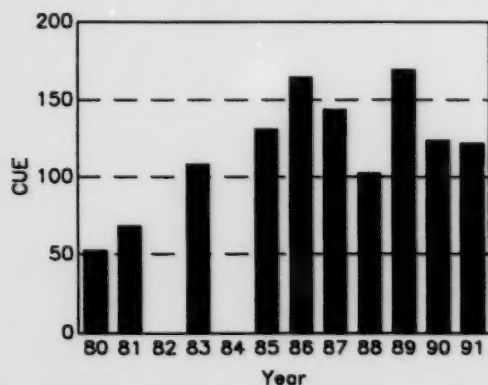


Figure 142. Lake trout/backcross annual gill net CUEs (kgs/km) for management area 5-8.

MANAGEMENT AREA 5-9**GENERAL**

- The total commercial fish allocation for all fish species under quota control remained unchanged at 63,698 kgs. Experimental fishing quotas issued for lake whitefish pushed the total quota to 67,568 kgs, 106% of the base commercial allocation.
- Harvest of all species under quota control decreased 18% to 50,524 kgs (Table 77). Value of these fish increased to \$120,730.
- Harvest and value of all species sold was 51,202 kgs and \$120,817, respectively (Table 78). An additional 6,748 kgs of species of no commercial value were reported discarded.

Table 77. Allocation, quota, harvest and percent quota taken by quota species for management area 5-9, 1991.

Species	Allocation (kgs)	Quota (kgs)	Harvest (kgs)	% Quota Taken
Channel Catfish	unlimited	unlimited	4	n/a
Chub	9958	9958	7164	71.9
Lake Sturgeon	136	136	40	29.4
Lake Trout	4927	4927	4729	96.0
Lake Whitefish	40710	44590	38541	86.4
Northern Pike	0	0	0	0.0
Pink Salmon	270	270	10	3.7
Walleye	820	820	34	4.1
Yellow Perch	6867	6867	2	0.0
Total	63698	67568	50524	

Table 78. Value, harvest and catch by species for management area 5-9, 1991.

Species	Value (\$)	Harvest (kgs)	Catch (kgs)
Burbot	0	181	1492
Channel Catfish	3	4	4
Chub	13627	7164	7164
Common Carp	0	94	94
Lake Herring	62	86	86
Lake Sturgeon	141	40	40
Lake Trout	18708	4729	4729
Lake Whitefish	87985	38541	38541
Pink Salmon	48	10	10
Round Whitefish	25	31	31
Suckers	0	286	5723
Walleye	213	34	34
Yellow Perch	5	2	2
Total	120817	51202	57950

LAKE WHITEFISH

- The allocation increased 10% to 44,590 kgs.
- The harvest increased by 93% to 38,541 kgs, 86% of the allocation (Figure 143).
- Gill net effort increased 39% to 164 kms (Figure 144).
- CUE increased by 39% to 235 kgs/km (Figure 145).
- Preliminary commercial catch sampling indicates that the increase in abundance resulted from the recruitment of the strong 1987 year-class.
- Abundance will increase in 1992 as the 1988 year-class recruits at age 4. The equally strong 1989 year-class will increase abundance in 1993 (Figure 5, page 109).

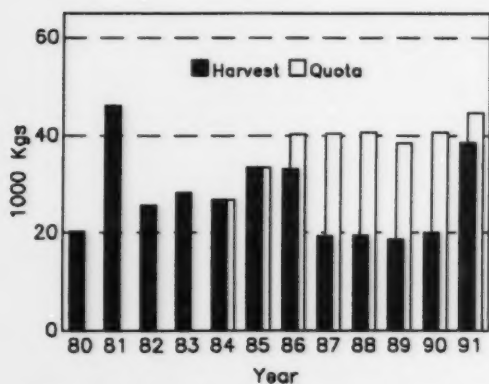


Figure 143. Lake whitefish harvest and quota (kgs) for management area 5-9.

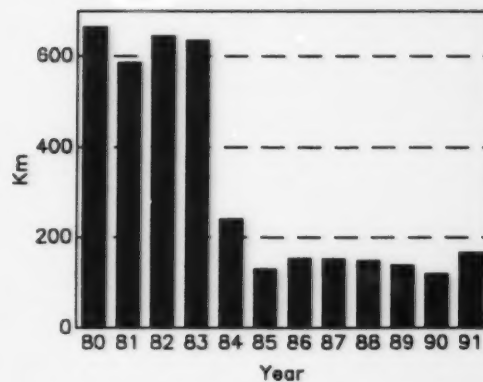


Figure 144. Lake whitefish annual gill net effort (km) for management area 5-9.

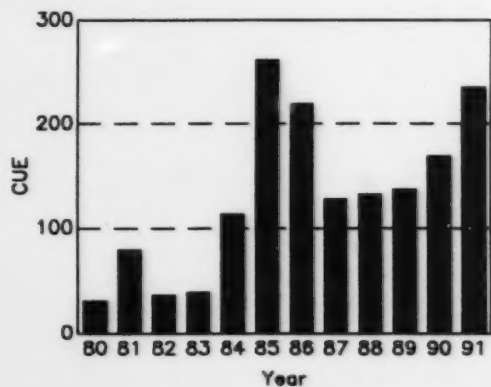


Figure 145. Lake whitefish annual gill net CUEs (kgs/km) for management area 5-9.

CHUB

- Allocation remained unchanged at 9,958 kgs. Quota issued equalled the allocation
- Harvest decreased 28% to 7,164 kgs, 72% of the allocation (Figure 146).
- Effort decreased 11% to 61 km (Figure 147).
- CUE decreased 20% to 117 kgs/km (Figure 148).
- Abundance declined, likely the result of the diminishing presence of the 1983 year-class in the fishery.
- Abundance should continue to decline in 1992 and 1993 as weak year-classes enter the fishery (Figure 95, page 82; Figure 139, page 110). The strong 1988 year-class will not have an effect on the fishery until 1994.

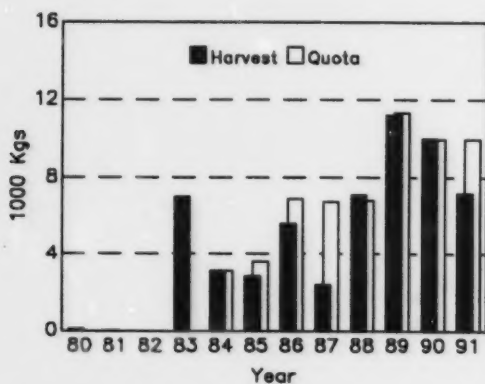


Figure 146. Chub harvest and quota (kgs) for management area 5-9.

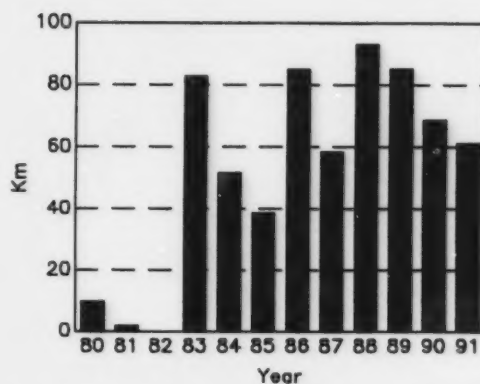


Figure 147. Chub annual gill net effort (km) for management area 5-9.

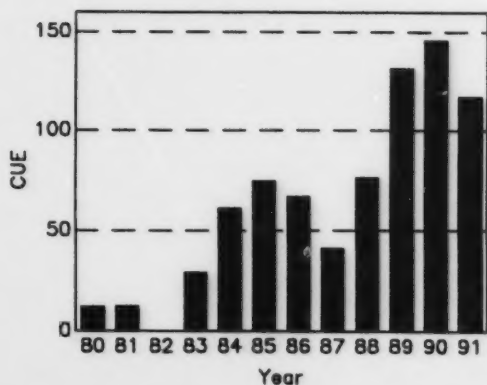


Figure 148. Chub annual gill net CUEs (kgs/km) for management area 5-9.

LAKE TROUT/BACKCROSS

- Allocation was unchanged at 4,927 kgs. Quota issued equalled allocation.
- The harvest decreased 2% to 4,729 kgs, 96% of the allocation (Figure 149).
- Effort increased 50% to 119 km (Figure 150).
- CUE decreased 34% to 40 kgs/km (Figure 151).
- Total mortality rates above age 4 remain over 60%, above the recommended 40% guideline.

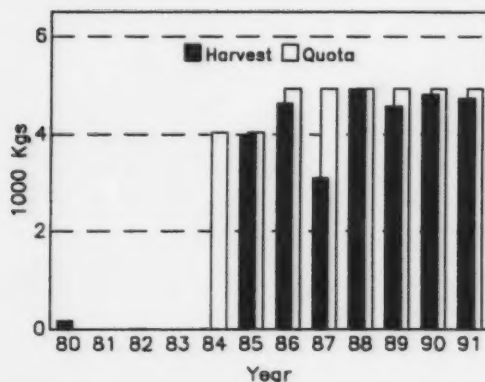


Figure 149. Lake trout/backcross harvest and quota (kgs) for management area 5-9.

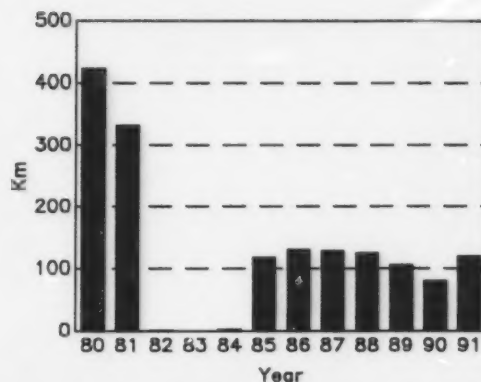


Figure 150. Lake trout/backcross annual gill net effort (km) for management area 5-9.

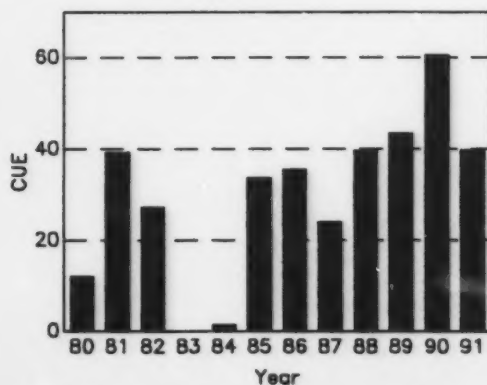


Figure 151. Lake trout/backcross annual gill net CUEs (kgs/km) for management area 5-9.

NORTH CHANNEL



GENERAL

- The total commercial fish allocation for all fish species under quota control increased to 482,530, the result of an scheduled odd-year increase in the pink salmon allocation (Table 79).
- Quota issued on commercial fish licences equalled the commercial fish allocation.
- Harvest of all fish species under quota control increased to 249,489 kg. Value of the harvest of species under quota control increased to \$645,802..
- Harvest and value of all fish species sold was 288,574 kg and \$670,672, respectively (Table 80). An additional 83,295 kgs of species of no commercial value were reported discarded.

Table 79. Allocation, quota, harvest and percent quota taken by quota species for North Channel, 1991.

Species	Allocation (kgs)	Quota (kgs)	Harvest (kgs)	% Quota Taken
Channel Catfish	10007	10007	145	1.4
Chub	0	0	63	0.0
Lake Sturgeon	5493	5493	1732	31.5
Lake Trout	8120	8120	8855	109.1
Lake Whitefish	221350	221350	168623	76.2
Northern Pike	16500	16500	4072	24.7
Pink Salmon	132328	132328	2730	2.1
Walleye	20069	20069	12668	63.1
Yellow Perch	68663	68663	50601	73.7
Total	482530	482530	249489	

Table 80. Value, harvest and catch by species for North Channel, 1991.

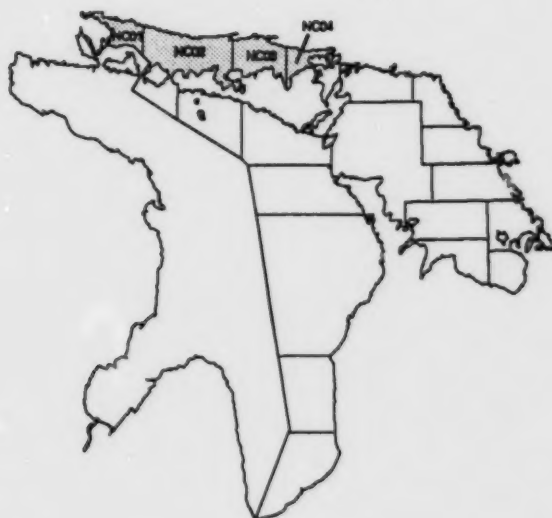
Species	Value (\$)	Harvest (kgs)	Catch (kgs)
Black Crappie	170	103	103
Bullhead	178	160	188
Burbot	53	101	514
Caviar	264	65	65
Channel Catfish	135	145	148
Chinook Salmon	0	8	372
Chub	107	63	91
Common Carp	1038	1182	1462
Lake Herring	14604	18805	18805
Lake Sturgeon	6722	1732	1732
Lake Trout	20633	8855	8951
Lake Whitefish	357374	168623	168787
Northern Pike	7622	4072	4072
Pacific Salmon	0	239	282
Pink Salmon	2751	2730	3666
Rainbow Smelt	3821	7880	7881
Rainbow Trout	0	2	30

... continued

Table 80 (con't). Value, harvest and catch by species for management area 6-1, 1991.

Species	Value (\$)	Harvest (kgs)	Catch (kgs)
Rock Bass	189	171	687
Round Whitefish	4371	5602	5625
Stonecat	0	5	5
Suckers	75	4565	50656
Walleye	39251	12668	12675
Yellow Perch	211314	50601	50601
Discarded (mixed)	0	197	34471
Total	670672	288574	371869

MANAGEMENT AREA 6-1



GENERAL

- Although the total commercial fish allocation increased significantly (126%), the result of the normal even-odd year manipulation of pink salmon quota, the buyout of a licence by the Ontario Ministry of Natural Resources reduced the allocation for the rest of the quota species.
- Quota issued equalled the allocation.
- Harvest of all fish species under quota control increased 27% to 247,977 kgs (Table 81).
- Harvest and value of all species sold was 287,062 kg and \$670,672, respectively (Table 82). An additional 83,295 kg of species of no commercial value were reported discarded.

Table 81. Allocation, quota, harvest and percent quota taken by quota species for management area 6-1, 1991.

Species	Allocation (kgs)	Quota (kgs)	Harvest (kgs)	% Quota Taken
Channel Catfish	9553	9553	145	1.5
Chub	0	0	63	*
Lake Sturgeon	5493	5493	1732	31.5
Lake Trout	7232	7232	8493	117.4
Lake Whitefish	216576	216576	167477	77.3
Northern Pike	16036	16036	4068	25.4
Pink Salmon	132328	132328	2730	2.1
Walleye	20069	20069	12668	63.1
Yellow Perch	67418	67418	50601	75.1
Total	474705	474705	247977	

* harvest without quota

Table 82. Value, harvest and catch by species for management area 6-1, 1991.

Species	Value (\$)	Harvest (kgs)	Catch (kgs)
Black Crappie	170	103	103
Bullhead	178	160	188
Burbot	53	101	514
Caviar	264	65	65
Channel Catfish	135	145	148
Chinook Salmon	0	8	372
Chub	107	63	91
Common Carp	1038	1182	1462
Lake Herring	14604	18805	18805
Lake Sturgeon	6722	1732	1732
Lake Trout	20633	8493	8589
Lake Whitefish	357374	167477	167641
Northern Pike	7622	4068	4068
Pacific Salmon	0	239	282
Pink Salmon	2751	2730	3666

... continued

Table 82 (con't). Value, harvest and catch by species for management area 6-1, 1991.

Species	Value (\$)	Harvest (kgs)	Catch (kgs)
Rainbow Smelt	3821	7880	7881
Rainbow Trout	0	2	30
Rock Bass	189	171	687
Round Whitefish	4371	5602	5625
Stonecat	0	5	5
Suckers	75	4565	50656
Walleye	39251	12668	12675
Yellow Perch	211314	50601	50601
Discarded (mixed)	0	197	34471
Total	670672	287062	370357

LAKE WHITEFISH

- The allocation remained unchanged at 216,576 kgs. Quota issued equalled the allocation.
- The harvest increased 23% to 167,640 kgs, 77% of the allocation (Figure 152, 153, 154). The gill net fishery accounted for 93% of the harvest with the remainder coming out of the trap net fishery.
- Gill net effort decreased 14% to 2,694 kms (Figure 155). Trap net decreased 34% to 114 lifts (Figure 156).
- The gill net CUE increased in all sub-areas (Figure 157). The trap net CUE increased 128% (Figure 158).
- Age 4 fish dominated the catch (Tables 83, 84, 85, 86, 87). All other ages were weakly represented relative to the mid-80s.
- Abundance increased as predicted due to the continued recruitment of the strong 1987 year-class as age 4 fish (Tables 88, 89, 90, 91, 92).
- Abundance will change little in 1992. The fishery will depend mainly on age 5 fish (1987 year-class) in 1992. Preliminary cooperative pre-recruit indexing suggests that the 1988 year-class is substantially weaker than the 1987 year-class (Figure 159).

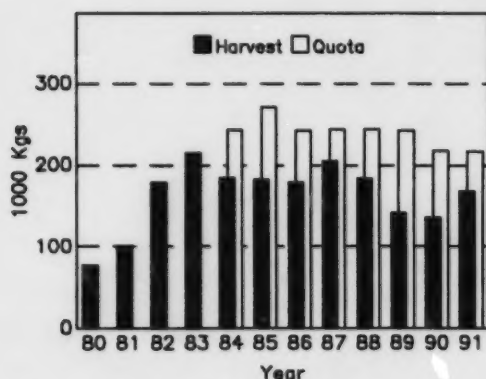


Figure 152. Lake whitefish harvest and quota (kgs) for management area 6-1.

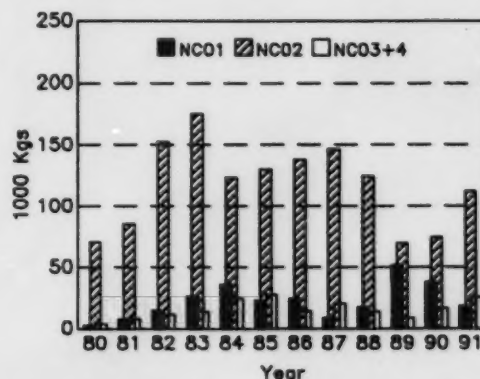


Figure 153. Lake whitefish gill net harvest (kgs) by subarea for management area 6-1.

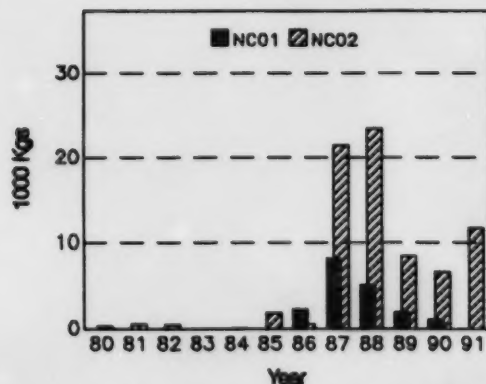


Figure 154. Lake whitefish trap net harvest (kgs) by subarea for management area 6-1.

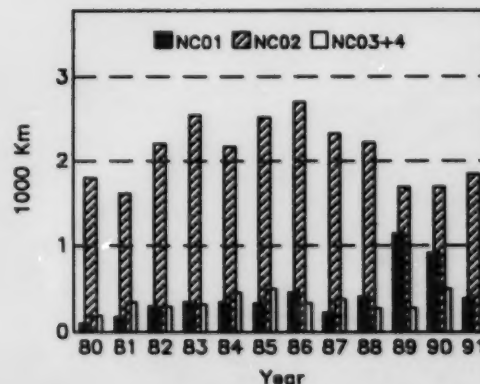


Figure 155. Lake whitefish gill net effort (km) by subarea for management area 6-1.

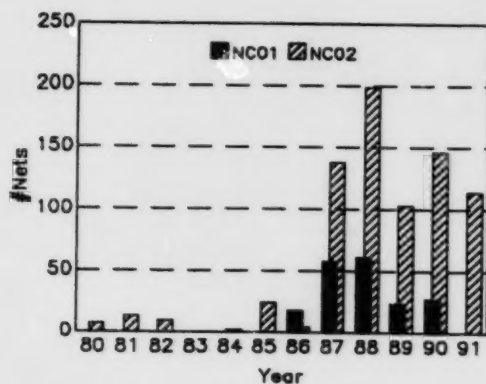


Figure 156. Lake whitefish trap net effort by subarea for management area 6-1.

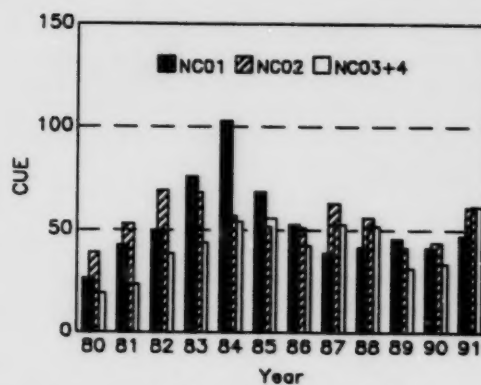


Figure 157. Lake whitefish gill net CUES (kgs/km) by subarea for management area 6-1.

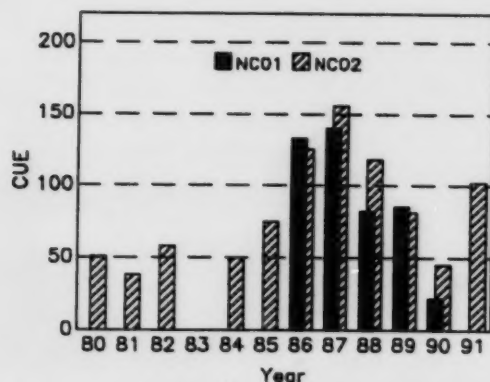


Figure 158. Lake whitefish trap net CUES (kgs/net) by subarea for management area 6-1.

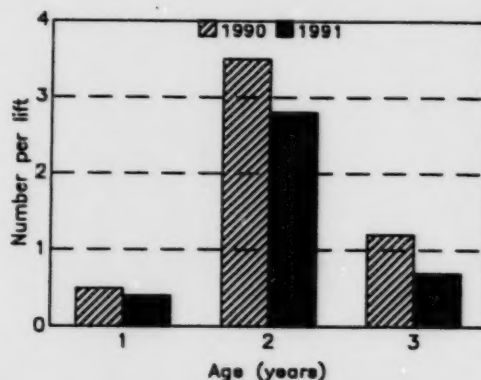


Figure 159. Lake whitefish CUES-at-age from index fishing in management area 6-1, 1990 - 1991 (2" and 2.5" mesh sizes only).

Table 83. Age-class composition of lake whitefish harvested in gill nets in assessment area NC01 (subarea of management area 6-1).

AGE	1990	1991
1	0	0
2	0	0
3	104	259
4	2192	3783
5	2923	1088
6	6681	622
7	5637	725
8	3236	466
9	2297	363
10	2714	104
11	209	259
12	0	104
13	104	0
>13	0	0

Table 84. Age-class composition of lake whitefish harvested in gill nets in assessment area NC02 (subarea of management area 6-1).

AGE	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
1	0	0	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	243	94	0
3	2195	419	0	2231	7128	4617	5183	3591	2762	9679	19876	6370
4	19194	25125	7325	9670	26303	28152	55283	22841	29131	6504	14573	55907
5	6465	14844	79375	44748	21501	28626	23657	38994	30001	17071	5463	8960
6	8662	4511	7025	50912	13942	14971	10063	13888	17101	8976	5922	1155
7	10926	5245	3011	5458	9598	8711	3225	3741	4804	3571	3323	821
8	2213	1784	1806	1114	1621	4280	834	1470	750	767	1018	837
9	536	106	1505	1114	897	557	371	180	0	313	425	433
10	85	210	0	320	411	495	212	30	0	179	284	76
11	85	106	301	0	637	434	82	30	0	0	0	0
12	0	0	0	0	215	743	0	0	0	0	0	0
13	85	106	0	0	0	0	0	0	0	0	0	0
>13	0	0	0	0	108	186	0	0	0	0	0	0

Table 85. Age-class composition of lake whitefish harvested in trap nets in assessment area NC02 (subarea of management area 6-1).

AGE	1987	1988	1989	1990	1991
1	0	0	0	0	0
2	0	101	66	351	0
3	204	663	617	2916	1432
4	3089	5997	779	1186	6847
5	5416	8080	2030	786	754
6	4828	3399	1969	1043	195
7	2304	709	612	365	300
8	548	936	154	274	109
9	0	0	245	239	56
10	0	0	48	286	0
11	0	0	0	36	0
12	47	0	10	0	0
13	0	0	0	6	0
>13	0	0	0	0	0

Table 86. Age-class composition of lake whitefish harvested in gill nets in assessment area NC03 (subarea of management area 6-1).

AGE	1984	1985	1986	1987	1988	1989	1990	1991
1	0	0	0	0	0	0		0
2	7	0	0	0	0	0		0
3	2306	1676	479	764	59	567		1237
4	5697	6754	4225	7510	2773	680	N	13321
5	9687	2242	1719	8741	2408	823	O	1456
6	4085	1157	332	5590	452	677		171
7	1898	413	408	960	118	450	D	516
8	505	184	68	714	0	129	A	171
9	472	106	0	345	0	242	T	234
10	472	47	0	0	59	66	A	140
11	232	28	0	0	0	0		140
12	0	18	0	0	0	0		140
13	232	0	0	0	0	0		0
>13	0	18	0	0	0	0		47

Table 87. Age-class composition of harvested and released lake whitefish caught in trap nets in assessment area NC02 (subarea of management area 6-1).

AGE	1988	1989	1990	1991
1	0	12	0	13
2	440	396	947	553
3	1792	965	5769	3360
4	7013	875	1641	7927
5	8645	2110	873	811
6	3399	1969	1110	195
7	2304	612	365	300
8	548	169	274	109
9	0	245	239	56
10	0	48	296	0
11	0	0	36	0
12	47	10	0	0
13	0	0	6	0
>13	0	0	0	0

Table 88. CUE-at-age (number/km) for lake whitefish harvested in gill nets in assessment area NC01 (subarea of management area 6-1).

AGE	1990	1991
1	0.00	0.00
2	0.00	0.00
3	0.11	0.91
4	2.41	13.31
5	3.21	3.83
6	7.34	2.19
7	6.20	2.55
8	3.56	1.64
9	2.52	1.28
10	2.98	0.36
11	0.23	0.91
12	0.00	0.36
13	0.11	0.00
>13	0.00	0.00

Table 89. CUE-at-age (number/km) for lake whitefish harvested in gill nets in assessment area NC02 (subarea of management area 6-1).

AGE	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.14	0.06	0.00
3	1.22	0.26	0.00	0.88	3.28	1.83	1.92	1.54	1.24	5.72	11.77	3.47
4	10.65	15.60	3.33	3.80	12.10	11.16	20.48	9.81	13.13	3.85	8.63	30.43
5	3.59	9.22	36.09	17.59	9.89	11.35	8.77	16.75	13.52	10.09	3.23	4.88
6	4.81	2.80	3.19	20.01	6.41	5.93	3.73	5.96	7.71	5.31	3.51	0.63
7	6.06	3.26	1.37	2.14	4.42	3.45	1.19	1.61	2.17	2.11	1.97	0.45
8	1.23	1.11	0.82	0.44	0.75	1.70	0.31	0.63	0.34	0.45	0.60	0.46
9	0.30	0.07	0.68	0.44	0.41	0.22	0.14	0.08	0.00	0.19	0.25	0.24
10	0.05	0.13	0.00	0.13	0.19	0.20	0.08	0.01	0.00	0.11	0.17	0.04
11	0.05	0.07	0.14	0.00	0.29	0.17	0.03	0.01	0.00	0.00	0.00	0.00
12	0.00	0.00	0.00	0.00	0.10	0.29	0.00	0.00	0.00	0.00	0.00	0.00
13	0.05	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
>13	0.00	0.00	0.00	0.00	0.05	0.07	0.00	0.00	0.00	0.00	0.00	0.00

Table 90. CUE-at-age (number/net) for lake whitefish harvested in trap nets in assessment area NC02 (subarea of management area 6-1).

AGE	1987	1988	1989	1990	1991
1	0.00	0.00	0.00	0.00	0.00
2	0.00	0.51	0.64	2.41	0.00
3	1.48	3.35	5.99	19.97	12.56
4	22.38	30.29	7.56	8.12	60.06
5	39.25	40.81	19.71	5.38	6.61
6	34.99	17.17	19.12	7.14	1.71
7	16.70	3.58	5.94	2.50	2.63
8	3.97	4.73	1.50	1.88	0.95
9	0.00	0.00	2.38	1.64	0.49
10	0.00	0.00	0.47	1.96	0.00
11	0.00	0.00	0.00	0.25	0.00
12	0.34	0.00	0.10	0.00	0.00
13	0.00	0.00	0.00	0.04	0.00
>13	0.00	0.00	0.00	0.00	0.00

Table 91. CUE-at-age (number/km) for lake whitefish harvested in gill nets in assessment area NC03 (subarea of management area 6-1).

AGE	1984	1985	1986	1987	1988	1989	1990	1991
1	0.00	0.00	0.00	0.00	0.00	0.00		0.00
2	0.02	0.00	0.00	0.00	0.00	0.00		0.00
3	5.58	4.56	1.64	2.26	0.28	2.60		2.99
4	13.78	18.37	14.49	22.17	13.01	3.12	N	32.18
5	23.44	6.10	5.90	25.81	11.29	3.78	O	3.52
6	9.88	3.15	1.14	16.50	2.12	3.11		0.41
7	4.59	1.12	1.40	2.83	0.55	2.07	D	1.25
8	1.22	0.50	0.23	2.11	0.00	0.59	A	0.41
9	1.14	0.29	0.00	1.02	0.00	1.11	T	0.57
10	1.14	0.13	0.00	0.00	0.28	0.30	A	0.34
11	0.56	0.08	0.00	0.00	0.00	0.00		0.34
12	0.00	0.05	0.00	0.00	0.00	0.00		0.34
13	0.56	0.00	0.00	0.00	0.00	0.00		0.00
>13	0.00	0.05	0.00	0.00	0.00	0.00		0.11

Table 92. CUE-at-age for harvested and released lake whitefish caught in trap nets in assessment area NC02 (subarea of management area 6-1).

AGE	1988	1989	1990	1991
1	0.0	0.1	0.0	0.1
2	2.2	3.8	9.2	4.9
3	9.1	9.4	56.0	29.5
4	35.4	8.5	15.9	69.5
5	43.7	20.5	8.5	7.1
6	17.2	19.1	10.8	1.7
7	3.6	5.9	3.5	2.6
8	4.7	1.6	2.7	1.0
9	0.0	2.4	2.3	0.5
10	0.0	0.5	2.9	0.0
11	0.0	0.0	0.3	0.0
12	0.0	0.1	0.0	0.0
13	0.0	0.0	0.0	0.0
>13	0.0	0.0	0.0	0.0

YELLOW PERCH

- Allocation decreased 8% to 67,418 kgs. Quota issued equalled the allocation.
- Harvest increased 19% to 50,601 kgs, 75% of the allocation (Figure 160). Most of the harvest came out of NC03 (66%) (Figure 161).
- Gill net effort increased 56% to 1,294 km (Figure 162).
- Gill net CUE decreased 24% (Figure 163).
- Ages 4 and 5 fish dominated the fishery in both NC02 and NC03 (Tables 93, 94). Age 4 is more prominent in the NC03 fishery.
- Abundance unexpectedly decreased in 1991. Age 4 fish (1987 year-class) contributed as expected; however, the decreased abundance is attributed to the poorer showing of older fish (Tables 95, 96).
- Abundance will decrease in 1992 and 1993 as the weak 1988 through 1990 year-classes enter the fishery (Figure 164). It is unlikely that the strong 1987 year-class will still be contributing to the fishery in the numbers required to offset the incoming weak year-classes.

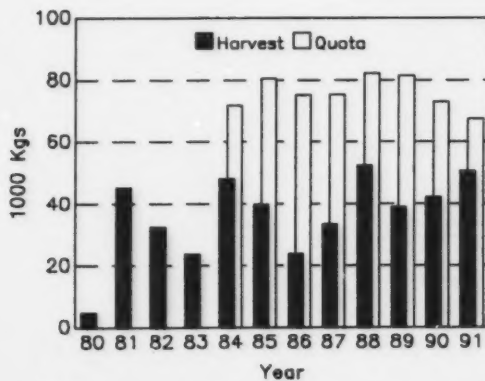


Figure 160. Yellow perch harvest and quota (kgs) for management area 6-1.

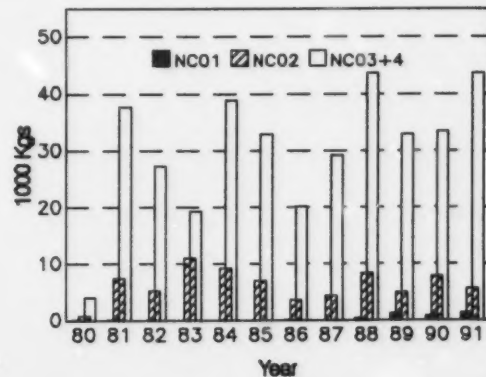


Figure 161. Yellow perch harvest (kgs) by subarea for management area 6-1.

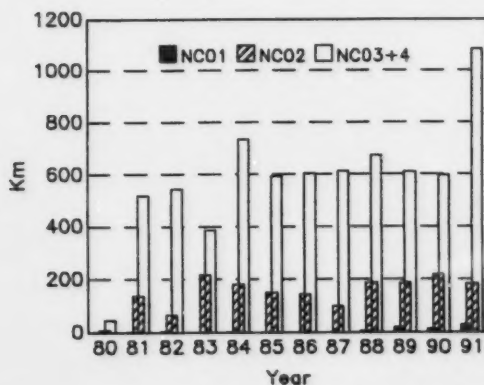


Figure 162. Yellow perch annual gill net effort (km) by subarea for management area 6-1.

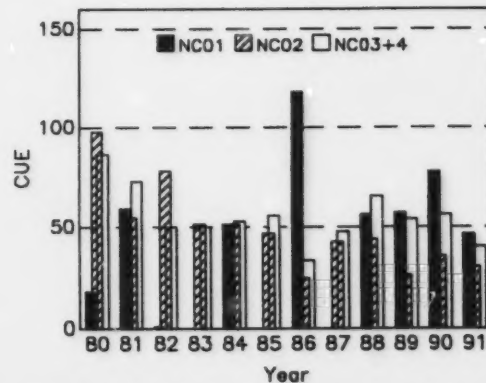


Figure 163. Yellow perch annual gill net CUES (kgs/km) by subarea for management area 6-1.

Table 93. Age-class composition of yellow perch harvested in gill nets in assessment area NC02 (subarea of management area 6-1).

AGE	1984	1985	1986	1987	1988	1989	1990	1991
1	0	0	0	0	0	0	0	0
2	0	0	0	0	0	702	138	51
3	780	2511	155	7	0	1681	4715	1336
4	7289	6338	1844	237	1608	4005	9445	12453
5	19283	12020	4658	3440	7570	9995	13771	13157
6	9436	11490	5794	9734	16532	4955	8040	3872
7	4806	3927	4164	6971	13163	3816	2642	738
8	923	305	1581	1667	887	1271	2172	872
9	71	159	30	0	733	274	327	288
10	0	0	0	61	0	176	107	67
11	0	0	0	61	0	0	0	0
12	0	0	0	0	0	196	0	0
13	0	0	124	0	0	0	0	0
>13	0	0	0	0	0	0	0	0

Table 94. Age-class composition of yellow perch harvested in gill nets in assessment area NC03 (subarea of management area 6-1).

AGE	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
1	0			0	0	0	0	0	0	0
2	0			0	0	0	0	903	1442	0
3	801			2689	2348	260	4046	25477	81321	17795
4	3743	N	N	18467	11713	41026	28208	70650	26633	202150
5	7432	O	O	40268	12121	34846	69761	21365	22621	19866
6	28065			28373	14583	7743	30046	12609	6128	4611
7	29757	D	D	4100	12080	6444	7129	2822	3781	1498
8	8356	A	A	4316	2363	915	1896	433	742	471
9	385	T	T	1937	258	632	2594	282	0	0
10	0	A	A	1452	269	0	0	0	0	0
11	0			753	0	0	0	0	0	0
12	0			0	179	0	0	0	0	0
13	0			0	0	0	0	0	0	0
>13	0			0	0	0	0	0	0	0

Table 95. CUE-at-age (number/km) for yellow perch harvested in gill nets in assessment area NC02 (subarea of management area 6-1).

AGE	1984	1985	1986	1987	1988	1989	1990	1991
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.00	0.00	0.00	0.00	0.00	3.74	0.63	0.28
3	4.34	16.68	1.09	0.07	0.00	8.95	21.54	7.36
4	40.54	42.11	12.94	2.37	8.60	21.33	43.15	68.57
5	107.25	79.87	32.69	34.33	40.48	53.22	62.91	72.45
6	52.48	76.35	40.66	97.15	88.41	26.38	36.73	21.32
7	26.73	26.09	29.22	69.57	70.39	20.32	12.07	4.07
8	5.13	2.03	11.09	16.64	4.74	6.77	9.92	4.80
9	0.39	1.06	0.21	0.00	3.92	1.46	1.50	1.59
10	0.00	0.00	0.00	0.61	0.00	0.94	0.49	0.37
11	0.00	0.00	0.00	0.61	0.00	0.00	0.00	0.00
12	0.00	0.00	0.00	0.00	0.00	1.04	0.00	0.00
13	0.00	0.00	0.87	0.00	0.00	0.00	0.00	0.00
>13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Table 96. CUE-at-age (number/km) for yellow perch harvested in gill nets in assessment area NC03 (subarea of management area 6-1).

AGE	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
1	0.00			0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.00			0.00	0.00	0.00	0.00	1.69	2.89	0.00
3	1.65			5.46	4.50	0.53	6.81	47.62	162.90	16.75
4	7.70	N	N	37.47	22.47	84.09	47.49	132.06	53.35	190.31
5	15.29	O	O	81.70	23.25	71.42	117.44	39.93	45.31	18.70
6	57.74			57.56	27.97	15.87	50.58	23.57	12.28	4.34
7	61.22	D	D	8.32	23.17	13.21	12.00	5.27	7.57	1.41
8	17.19	A	A	8.76	4.53	1.88	3.19	0.81	1.49	0.44
9	0.79	T	T	3.93	0.49	1.30	4.37	0.53	0.00	0.00
10	0.00	A	A	2.95	0.52	0.00	0.00	0.00	0.00	0.00
11	0.00			1.53	0.00	0.00	0.00	0.00	0.00	0.00
12	0.00			0.00	0.34	0.00	0.00	0.00	0.00	0.00
13	0.00			0.00	0.00	0.00	0.00	0.00	0.00	0.00
>13	0.00			0.00	0.00	0.00	0.00	0.00	0.00	0.00

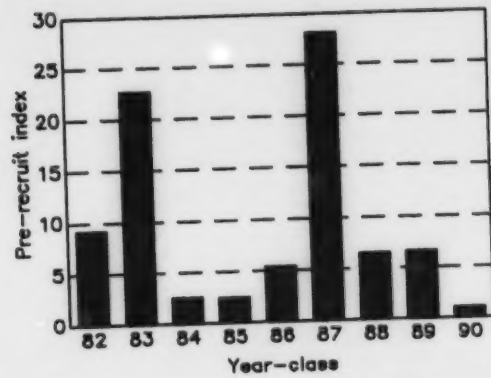


Figure 164. Indices of year-class strength for yellow perch from index gillnetting in management area 6-1.

WALLEYE

- Allocation decreased 5% to 20,069 kgs. Quota issued equalled the allocation.
- Harvest increased 3% to 13,171 kgs, 63% of the allocation (Figure 165). Most of the harvest occurred in NC01 (58%) (Figure 166).
- Gill net effort increased 160% to 829 km (Figure 167).
- Gill net CUE decreased 61% (Figure 168). However, our inability to isolate gear set for walleye from that set for other species, limits the reliance we can place on CUE as an indicator of abundance.
- The stock is fairly stable with over 12 age-classes contributing to the fishery (Table 97).
- Abundance in NC01 has been relatively constant with stable recruitment (Table 98).
- No change in abundance is forecast for 1992 or 1993.

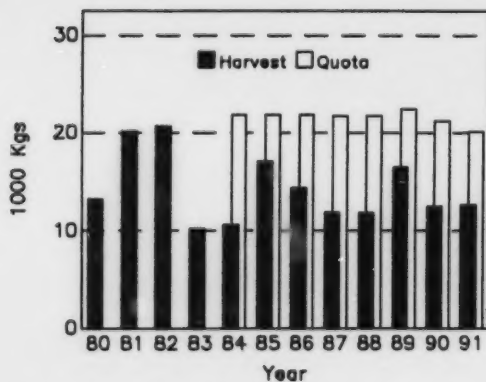


Figure 165. Walleye harvest and quota (kgs) for management area 6-1.

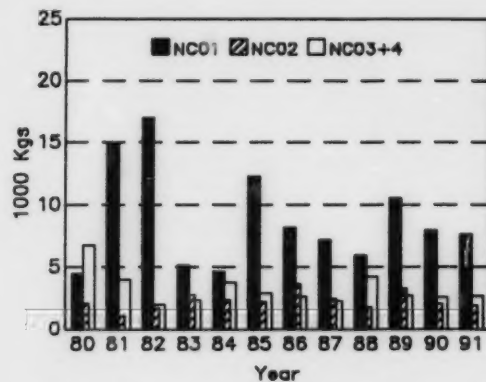


Figure 166. Walleye harvest (kgs) by subarea for management area 6-1.

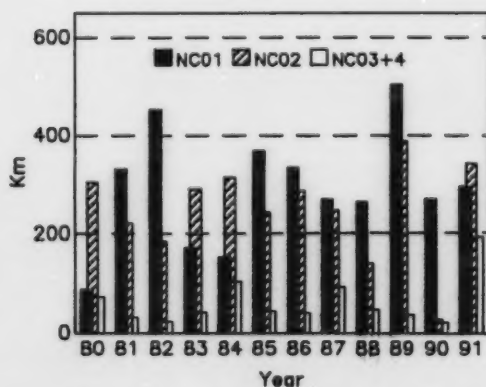


Figure 167. Walleye annual gill net effort (km) by subarea for management area 6-1.

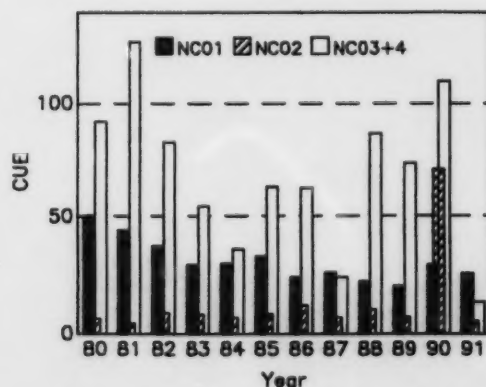


Figure 168. Walleye gill net CUEs (kgs/km) by subarea for management area 6-1.

Table 97. Age-class composition of walleye harvested in gill nets in assessment area NC01 (subarea of management area 6-1).

AGE	1984	1985	1986	1987	1988	1989	1990	1991
1	0	0	0		0	0	0	0
2	0	0	0		94	0	29	0
3	0	0	0		0	37	0	307
4	82	317	15	N	436	53	351	632
5	418	1563	583	O	578	1183	556	602
6	857	1635	1230		1607	597	1552	1063
7	621	2800	1647	D	891	1684	351	1147
8	267	1635	1431	A	245	1012	937	97
9	196	560	473	T	65	520	322	308
10	163	164	96	A	8	728	176	50
11	225	164	52		125	297	88	134
12	132	36	46		27	332	117	87
13	76	81	133		6	148	176	43
>13	148	81	0		15	73	29	43

Table 98. CUE-at-age of walleye harvested in gill nets in assessment area NC01 (subarea of management area 6-1).

AGE	1984	1985	1986	1987	1988	1989	1990	1991
1	0.00	0.00	0.00		0.00	0.00	0.00	0.00
2	0.00	0.00	0.00		0.36	0.00	0.11	0.00
3	0.00	0.00	0.00		0.00	0.07	0.00	1.09
4	0.54	0.86	0.04	N	1.66	0.11	1.31	2.23
5	2.73	4.25	1.74	O	2.20	2.35	2.08	2.13
6	5.60	4.45	3.68		6.12	1.19	5.79	3.76
7	4.06	7.61	4.93	D	3.39	3.35	1.31	4.05
8	1.74	4.45	4.28	A	0.93	2.01	3.50	0.34
9	1.28	1.52	1.41	T	0.25	1.03	1.20	1.09
10	1.06	0.45	0.29	A	0.03	1.45	0.66	0.18
11	1.47	0.45	0.16		0.48	0.59	0.33	0.47
12	0.86	0.10	0.14		0.10	0.66	0.44	0.31
13	0.50	0.22	0.40		0.02	0.29	0.66	0.15
>13	0.97	0.22	0.00		0.06	0.15	0.11	0.15

LAKE TROUT/BACKCROSS

- Allocation decreased 7% to 7,232 kgs. Quota issued equalled the allocation.
- Harvest increased 20% to 8,588 kgs, 119% of the allocation (Figure 169). Most of the harvest occurred in areas NC02 and NC03+4 (Figure 170).
- CUE is given by assessment area in Figure 171.
- No prediction concerning future abundance.

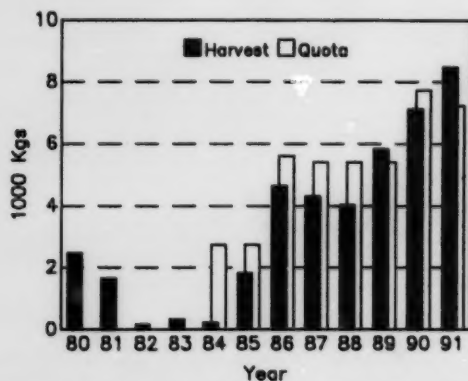


Figure 169. Lake trout/backcross harvest and quota (kgs) for management area 6-1.

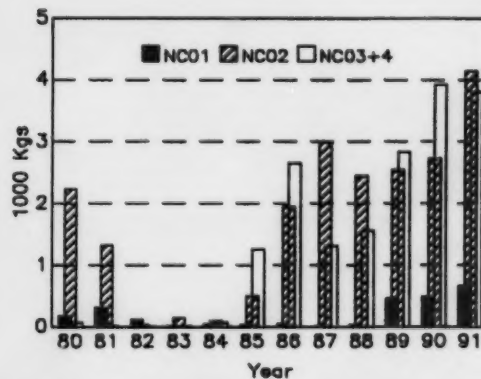


Figure 170. Lake trout/backcross harvest (kgs) by subarea for management area 6-1.

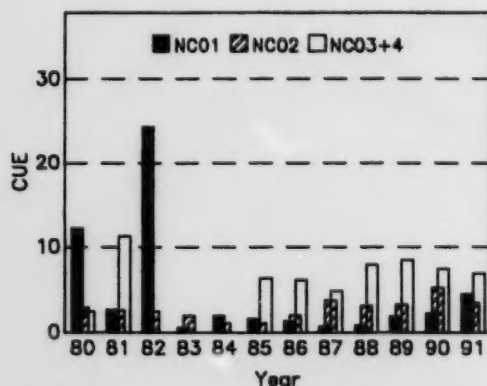


Figure 171. Lake trout/backcross gill net CUEs (kg/km) by subarea for management area 6-1.

NORTHERN PIKE

- Allocation decreased 14% to 16,036 kgs. Quota issued equalled the allocation.
- Harvest decreased to 4,068 kgs (Figure 172).
- No prediction concerning future abundance.

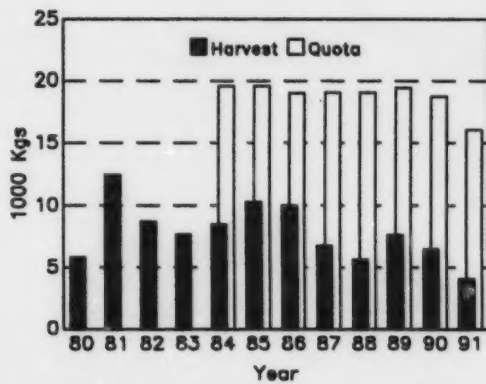


Figure 172. Northern pike harvest and quota (kgs) for management area 6-1.

PINK SALMON

- Allocation increased substantially to 132,328 kgs. Quota issued equalled the allocation.
- Harvest increased to 3,666 kgs (Figure 173).
- No prediction concerning future abundance.

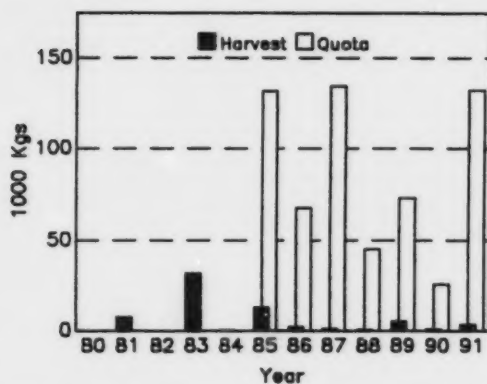


Figure 173. Pink salmon harvest and quota (kgs) for management area 6-1.

MANAGEMENT AREA 6-3**GENERAL**

- The total commercial fish allocation for all fish species under quota control remained constant at 7,825 kgs (Table 99).
- Quota issued on commercial fish licences equalled the commercial fish allocation.
- Harvest of all fish species under quota control decreased to 1,512 kgs. Value of the harvest of species under quota control was not reported on the monthly fishing reports.

Table 99. Allocation, quota, harvest and percent quota taken by quota species for management area 6-3, 1991.

Species	Allocation (kgs)	Quota (kgs)	Harvest (kgs)	% Quota Taken
Channel Catfish	454	454	0	0.0
Chub	0	0	0	0.0
Lake Sturgeon	0	0	0	0.0
Lake Trout	888	888	362	40.8
Lake Whitefish	4774	4774	1146	24.0
Northern Pike	464	464	4	0.9
Pink Salmon	0	0	0	0.0
Walleye	0	0	0	0.0
Yellow Perch	1245	1245	0	0.0
Total	7825	7825	1512	

Table 100. Value, harvest and catch by species for management area 6-3, 1991.

Species	Value (\$)	Harvest (kgs)	Catch (kgs)
Lake Trout	0	362	362
Lake Whitefish	0	1146	1146
Northern Pike	0	4	4
Total	0	1512	1512

LAKE WHITEFISH

- The allocation remained at 4,774 kgs. Quota issued equalled the allocation.
- The harvest decreased 54% to 1,146 kgs, 24% of the allocation (Figure 174).
- Gill net effort decreased 75% to 4 kms (Figure 175).
- CUE increased 83% to 310 kgs/km (Figure 176).
- Extreme fluctuations in harvest and effort preclude using CUE as an indicator of abundance.
- No comment on future abundance.

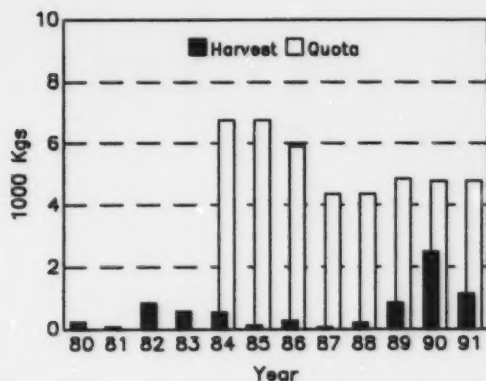


Figure 174. Lake whitefish harvest and quota (kgs) for management area 6-3.

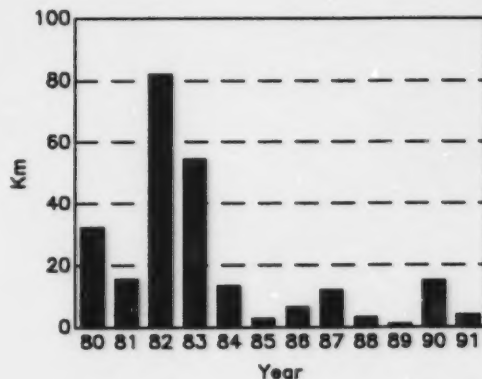


Figure 175. Lake whitefish annual gill net effort (km) for management area 6-3.

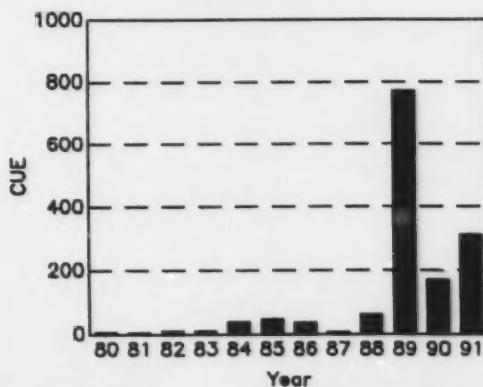


Figure 176. Lake whitefish annual gill net CUEs (kgs/km) for management area 6-3.

YELLOW PERCH

- Allocation remained at 1,245 kgs. Quota issued equalled the allocation.
- No harvest or effort in 1991 (Figure 177 and 178).

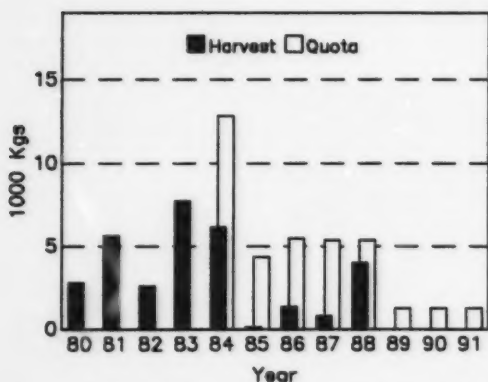


Figure 177. Yellow perch harvest and quota (kgs) for management area 6-3.

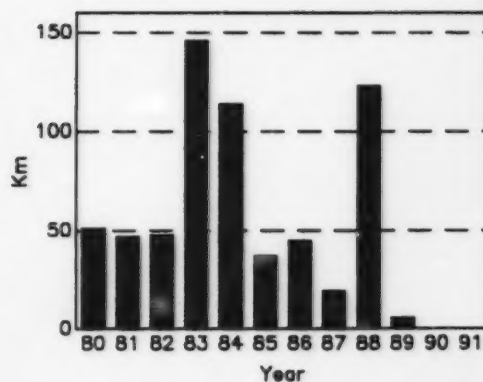


Figure 178. Yellow perch annual gill net effort (km) for management area 6-3.

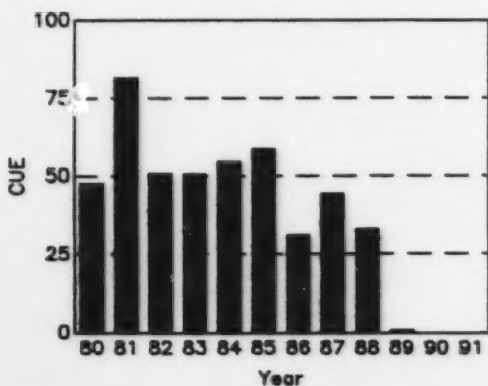


Figure 179. Yellow perch annual gill net CUEs (kgs/km) for management area 6-3.

LAKE TROUT/BACKCROSS

- Allocation remained at 888 kgs. Quota issued equalled allocation.
- Harvest decreased 35% to 362 kgs, 41% of the allocation (Figure 180).

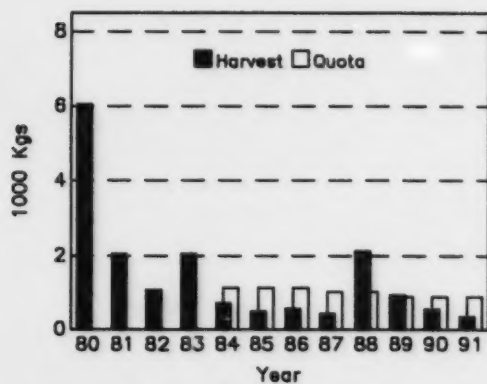


Figure 180. Lake trout/backcross harvest and quota (kgs) for management area 6-3.

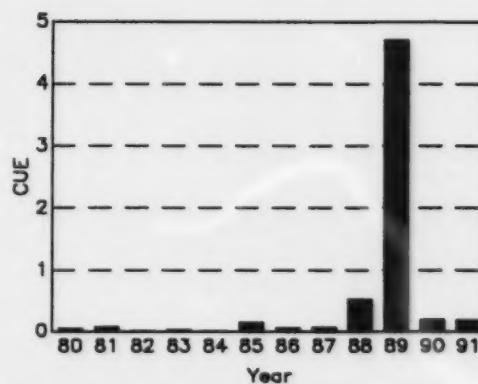


Figure 181. Lake trout/backcross annual gill net CUEs (kgs/km) for management area 6-3.

ACKNOWLEDGEMENTS

We would like to express our sincere appreciation to the large number of commercial fishermen who provided commercial catch sampling contractors unhindered access to their vessels and catches (see Appendix 3). As well, we would like to thank the many Lake Huron Fisheries Assessment Unit staff involved in the various programs that made the production of this document possible. Jim Hastie handled the administration and quality control activities associated with the commercial catch sampling contracts, and the training, scheduling and supervision of index netting boat and lab crews. Index netting operations were carried out by Darrell Wilson, Jeff Stewart, Dave Shipley, and Kevin Zeleny. Darrell Wilson also interpreted ages from scale samples. Data were entered and maintained by Louise Hillyer.

APPENDIX 1

Table 1. Lake whitefish harvest, quota, effort and CUE for management area 4-1.

Year	Harvest (kgs)	Quota (kgs)	Percent Taken	Effort (km)	CUE (kgs/km)
1979	7272	N/A	N/A	203.8	34.8
1980	14184	N/A	N/A	607.4	23.3
1981	27823	N/A	N/A	620.6	44.8
1982	44208	N/A	N/A	339.9	111.9
1983	64974	N/A	N/A	485.1	113.8
1984	45918	65217	70.4	661.2	61.6
1985	39934	65217	61.2	694.6	57.5
1986	47259	65217	72.5	678.3	69.7
1987	59484	75172	79.1	664.1	92.8
1988	48566	71932	67.5	638.4	76.1
1989	31470	71932	43.7	485.3	64.8
1990	28356	71932	39.4	388.6	73.0
1991	13342	71932	18.5	251.8	53.0

Table 2. Chub harvest, quota, effort and CUE for management area 4-1.

Year	Harvest (kgs)	Quota (kgs)	Percent Taken	Effort (km)	CUE (kgs/km)
1979	2602	N/A	N/A	55.1	47.2
1980	3569	N/A	N/A	70.0	51.0
1981	2729	N/A	N/A	59.3	45.9
1982	318	N/A	N/A	0.0	0.0
1983	2722	N/A	N/A	35.4	49.0
1984	10106	15713	64.3	172.8	48.6
1985	15756	18070	87.2	232.2	67.9
1986	17115	18643	91.8	296.9	57.6
1987	13535	18685	72.4	204.5	65.0
1988	16883	20549	82.2	217.0	77.8
1989	20414	20549	99.3	263.8	77.4
1990	21814	22833	95.5	269.6	80.9
1991	3292	22833	14.4	37.2	88.5

Table 3. Lake whitefish harvest, quota, effort and CUE for management areas 4-2.

Year	Harvest (kgs)			Quota (kgs)	Percent Taken	Gill Effort (km)	Impd Effort (# of nets)	Gill CUE (kgs/km)	Impd CUE (kgs/net)
	Gill	Impd	Total						
1979	60114	8318	68432	N/A	N/A	2167.9	112	27.7	74.3
1980	98789	10551	109340	N/A	N/A	2804.0	178	35.2	59.3
1981	110763	3663	114426	N/A	N/A	2088.4	44	53.0	83.2
1982	92296	21803	114099	N/A	N/A	1404.8	247	65.7	88.3
1983	75645	21047	96692	N/A	N/A	1003.7	231	75.4	91.1
1984	94753	21474	116227	132910	87.4	1521.4	219	62.3	98.1
1985	108579	20433	129012	132910	97.1	1162.8	251	93.4	81.4
1986	115121	21983	137104	132910	103.2	1426.0	249	80.7	88.3
1987	91570	25701	117271	153190	76.6	1123.8	233	81.5	110.3
1988	95881	48046	143927	153161	94.0	974.9	268	98.3	179.3
1989	70375	24064	94439	153161	61.7	937.5	228	75.1	105.5
1990	42698	18480	61178	153161	39.9	678.1	203	63.0	91.0
1991	63597	24704	88301	153161	57.7	976.9	202	65.1	122.3

Note: Impd = Impoundment Nets

Table 4. Chub harvest, quota, effort and CUE for management area 4-2.

Year	Harvest (kgs)	Quota (kgs)	Percent Taken	Effort (km)	CUE (kgs/km)	
					Harvest	Discards
1979	8647	N/A	N/A	277.9	29.0	
1980	7530	N/A	N/A	287.0	26.1	
1981	8217	N/A	N/A	210.1	36.6	
1982	32785	N/A	N/A	345.0	83.8	
1983	33180	N/A	N/A	437.0	66.1	
1984	42418	35584	119.2	537.0	77.8	
1985	35619	40922	87.0	507.8	69.6	
1986	35433	35584	99.6	458.5	76.1	2.8
1987	31237	35665	87.6	466.6	59.2	1.1
1988	38988	39224	99.4	544.0	71.7	0.6
1989	39142	39224	99.8	431.1	90.8	1.5
1990	43129	43582	99.0	317.1	136.0	5.2
1991	40771	43582	93.6	426.0	95.7	9.8

Table 5. Lake whitefish harvest, quota, effort and CUE for management area 4-3.

Year	Harvest (kgs)	Quota (kgs)	Percent Taken	Effort (km)	CUE (kgs/km)
1979	85184	N/A	N/A	1320.2	60.8
1980	47248	N/A	N/A	935.8	49.1
1981	35723	N/A	N/A	608.4	49.5
1982	74980	N/A	N/A	612.7	56.5
1983	45128	N/A	N/A	366.0	112.5
1984	36678	79520	46.1	355.3	102.3
1985	51611	79520	64.9	592.9	97.8
1986	38839	79518	48.8	439.4	88.8
1987	41467	114478	36.2	411.8	103.7
1988	69197	99768	69.4	805.1	85.9
1989	64713	98194	65.9	831.7	77.8
1990	69483	88263	78.7	953.0	71.4
1991	105934	108377	97.7	1099.0	96.4

Table 6. Chub harvest, quota, effort, and CUE for management area 4-3.

Year	Harvest (kgs)	Quota (kgs)	Percent Taken	Effort (km)	CUE (kgs/km)	
					Harvest	Discards
1979	3296	N/A	N/A	69.4	45.9	
1980	9073	N/A	N/A	159.6	52.1	
1981	8859	N/A	N/A	116.9	31.6	
1982	6347	N/A	N/A	101.7	45.3	
1983	3482	N/A	N/A	32.9	65.7	
1984	30318	41640	72.8	274.8	109.4	
1985	39184	41640	94.1	478.9	83.1	
1986	34155	57603	59.3	536.8	64.0	3.8
1987	58471	59222	98.7	862.2	71.6	2.1
1988	47122	59371	79.4	662.5	71.1	3.4
1989	52317	59371	88.1	586.9	89.1	4.1
1990	45152	65751	68.7	429.0	105.2	14.6
1991	33334	65751	50.7	421.8	79.0	10.6

Table 7. Lake whitefish harvest, quota, effort and CUE for management area 4-4.

Year	Harvest (kgs)			Quota (kgs)	Percent Taken	Gill Effort (km)			CUE (kgs/km)	
	LH05	LH06	Total			LH05	LH06	Total	LH05	LH06
1979	80249	0	80249	N/A	N/A	714.0	0.0	714.0	112.0	0.0
1980	153897	68	153965	N/A	N/A	1290.7	0.0	1290.7	117.0	0.0
1981	103444	4304	107748	N/A	N/A	907.2	19.8	927.0	110.6	204.2
1982	157270	592	157862	N/A	N/A	1572.9	4.6	1577.5	98.3	67.4
1983	199122	588	199710	N/A	N/A	1427.2	8.4	1435.6	137.3	70.0
1984	256189	944	257133	273339	94.1	1349.7	13.0	1362.7	189.8	72.3
1985	312497	508	313005	273339	114.5	1053.5	0.9	1054.4	287.0	356.7
1986	241737	2	241739	284321	85.0	992.0	0.0	992.0	236.3	0.0
1987	343893	0	343893	327557	105.0	1456.4	0.0	1456.4	236.1	0.0
1988	261822	26758	288580	327495	88.1	1029.0	165.7	1194.7	254.4	161.5
1989	283154	36672	319826	327495	97.7	1210.0	145.7	1355.7	233.8	251.7
1990	332223	31589	363812	360244	101.0	1151.9	106.1	1258.0	288.4	297.7
1991	381527	42643	424170	432293	98.1	1061.6	136.0	1197.6	359.4	313.5

Table 8. Chub harvest, quota, effort and CUE for management area 4-4.

Year	Harvest (kgs)				Quota (kgs)	% Taken	Gill Effort (km)				Gill CUE (kgs/km)			
	LH05	LH06	LH07	Total			LH05	LH06	LH07	Total	LH05 Harvest	LH06 Harvest	LH07 Harvest	4-4 Discard
1979	4926	2823	0	7749	N/A	N/A	51.2	73.3	0.0	124.5	89.8	38.5	—	
1980	7497	3337	0	10834	N/A	N/A	87.0	62.0	0.0	149.0	65.4	53.8	—	
1981	59968	30739	7878	98585	N/A	N/A	670.9	313.7	50.8	1035.4	79.4	98.0	155.1	
1982	70351	48684	0	119035	N/A	N/A	1018.5	757.0	0.0	1775.5	68.5	64.3	—	
1983	68080	58171	59708	185959	N/A	N/A	631.1	667.1	549.2	1847.4	93.1	87.2	108.7	
1984	73681	100951	64455	239087	275778	86.7	761.4	918.1	494.3	2173.8	86.2	109.8	190.4	
1985	23809	60298	58663	142770	317146	45.0	241.0	696.1	543.1	1480.2	98.8	86.6	108.0	
1986	39405	25966	56513	121884	277781	43.9	521.7	546.1	530.1	1597.9	75.5	47.5	106.6	1.5
1987	66119	15011	2662	83792	276398	30.3	763.9	268.8	27.6	1060.3	86.5	55.8	96.4	4.7
1988	90161	62350	51529	204040	234896	86.9	810.1	734.9	658.5	2203.5	111.3	84.8	78.3	22.1
1989	94352	45127	0	139479	234896	59.4	681.6	337.4	0.0	1019.0	138.4	133.7	—	7.2
1990	79294	55703	51229	186226	257211	72.4	480.5	308.2	150.0	938.6	165.0	180.8	341.6	17.8
1991	64627	76960	51894	193481	258385	74.9	423.2	531.5	364.0	1318.7	152.7	144.8	142.6	30.5

Table 9. Yellow perch harvest, quota, effort and CUE for management area 4-4.

Year	Harvest (kgs)			Quota (kgs)	Percent Taken	Gill Effort (km)			CUE (kgs/km)	
	LH05	LH06	Total			LH05	LH06	Total	LH05	LH06
1979	1688	995	2683	N/A	N/A	39.0	50.7	89.7	38.4	19.6
1980	9557	1245	10802	N/A	N/A	100.9	13.1	114.0	83.2	95.0
1981	3546	1324	4870	N/A	N/A	80.8	65.7	146.5	22.4	20.8
1982	5971	630	6601	N/A	N/A	138.1	32.7	170.8	39.2	19.3
1983	34380	7255	41635	N/A	N/A	469.7	112.9	582.6	57.9	65.3
1984	4868	3517	8385	10161	82.5	123.3	93.3	216.6	36.9	39.2
1985	5047	1723	6770	10161	66.6	81.1	15.9	97.0	55.1	108.4
1986	3749	4474	8223	10161	80.9	66.3	56.1	122.4	55.9	79.8
1987	13619	1302	14921	20362	73.3	170.5	32.1	202.6	74.6	40.6
1988	3372	2888	6260	20362	33.4	141.1	79.2	220.3	22.5	36.5
1989	6888	3854	10742	18327	58.6	219.2	39.6	258.8	27.8	97.3
1990	10567	1691	12258	18327	66.9	277.2	16.3	293.5	38.1	103.9
1991	13004	420	13424	18253	73.5	346.7	21.0	367.7	36.4	19.6

Table 10. Lake trout/backcross harvest and quota for management area 4-4.

Year	Harvest (kgs)			Quota (kgs)	Percent Taken
	LH05	LH06	Total		
1979	151	0	151	N/A	N/A
1980	330	1	331	N/A	N/A
1981	89	24	113	N/A	N/A
1982	192	205	397	N/A	N/A
1983	684	589	1273	N/A	N/A
1984	1287	22	1309	950	137.8
1985	262	106	368	950	38.7
1986	109	0	109	1583	6.9
1987	107	0	107	1593	6.7
1988	191	0	191	1593	12.0
1989	899	2	901	1582	57.0
1990	1592	12	1625	1582	102.7
1991	1882	124	2006	1582	78.8

Table 11. Lake whitefish harvest, quota, effort and CUE for management area 4-5.

Year	Harvest (kgs)			Quota (kgs)	Percent Taken	Gill Effort (km)	Trap Effort (# of nets)	Gill CUE (kgs/km)	Trap CUE (kgs/net)
	Gill	Trap	Total						
1979	215118	19364	234482	N/A	N/A	2797.2	759	76.9	25.5
1980	205078	32217	237295	N/A	N/A	2727.4	1086	75.2	29.7
1981	239470	34446	273916	N/A	N/A	2243.3	1275	106.7	27.0
1982	341880	46566	388446	N/A	N/A	2717.9	1248	125.8	37.3
1983	701812	90874	792686	N/A	N/A	4808.3	985	146.0	92.3
1984	473853	40795	514648	575068	89.4	4260.5	454	111.2	89.9
1985	537770	60800	598570	575068	104.1	2655.3	464	202.5	131.0
1986	514792	56593	571385	567358	100.7	2454.3	800	209.7	70.7
1987	531662	33265	564427	567806	99.4	2774.4	1010	191.6	32.9
1988	538241	24352	562593	567722	99.1	3060.7	626	175.9	38.9
1989	516942	36427	553369	578683	95.6	2310.5	873	223.7	41.7
1990	586046	18749	604795	625697	96.7	2055.3	148	285.1	126.7
1991	687471	35485	722956	753515	95.9	2850.5	772	241.2	46.0

Table 12. Chub harvest, quota, effort and CUE for management area 4-5.

Year	Harvest (kgs)	Quota (kgs)	Percent Taken	Effort (km)	CUE (kgs/km)	
					Harvest	Discards
1979	49165	N/A	N/A	571.9	86.0	
1980	77729	N/A	N/A	568.2	136.8	
1981	98467	N/A	N/A	1150.0	85.6	
1982	63887	N/A	N/A	1099.5	58.1	
1983	54482	N/A	N/A	721.2	75.5	
1984	161434	174608	92.5	2062.4	78.3	
1985	161753	200799	80.6	3833.0	42.2	
1986	97368	174637	55.8	1015.3	95.9	12.0
1987	47686	174855	27.3	830.9	57.4	6.2
1988	96898	158856	61.0	1385.5	69.9	4.6
1989	18709	169291	11.1	168.9	110.8	48.0
1990	31721	151161	21.0	188.6	168.2	93.4
1991	20110	153251	13.1	170.2	118.2	15.6

Table 13. Yellow perch harvest, quota, effort and CUE for management area 4-5.

Year	Harvest (kgs)			Quota (kgs)	Percent Taken	Gill Effort (km)	Trap Effort (# of nets)	Gill CUE (kgs/km)	Trap CUE (kgs/net)
	Gill	Trap	Total						
1979	49297	7415	56712	N/A	N/A	1557.0	2546	31.7	2.9
1980	183939	8301	192240	N/A	N/A	2289.5	2762	80.3	3.0
1981	225848	13897	239745	N/A	N/A	4598.2	2727	49.1	5.1
1982	127744	5636	133380	N/A	N/A	4833.2	2361	26.4	2.4
1983	99115	10789	109904	N/A	N/A	2880.9	2729	34.4	4.0
1984	198785	7566	206351	249353	82.8	3832.0	2139	51.9	3.5
1985	214888	13264	228152	249353	91.5	4976.8	2162	43.2	6.1
1986	233977	10529	244506	249353	98.1	3850.8	1785	60.8	5.9
1987	189704	11127	200831	313275	64.1	3239.8	2388	58.6	4.7
1988	154136	3814	157950	272522	58.0	2930.9	1505	52.6	2.5
1989	231414	8148	239562	279834	85.6	3509.1	1827	65.9	4.5
1990	180063	4239	184302	264894	69.6	3026.0	2294	59.5	1.8
1991	209190	13277	222467	281996	78.9	4306.5	1998	48.6	6.6

Table 14. Walleye harvest, quota, effort and CUE for management area 4-5.

Year	Harvest (kgs)			Quota (kgs)	Percent Taken	Gill Effort (km)	Trap Effort (# of nets)	Gill CUE (kgs/km)	Trap CUE (kgs/net)
	Gill	Trap	Total						
1979	10537	84262	94799	N/A	N/A	818.2	2583	12.9	32.6
1980	20712	104302	125014	N/A	N/A	932.4	2798	22.2	37.3
1981	21741	100645	122386	N/A	N/A	1176.5	2898	18.5	34.7
1982	26418	87995	114413	N/A	N/A	1502.0	2253	17.6	39.1
1983	27095	93930	121025	N/A	N/A	1195.9	2905	22.7	32.3
1984	21757	107277	129034	125355	102.9	1170.8	3300	18.6	32.5
1985	17154	102446	119600	125355	95.4	512.1	2163	33.5	47.4
1986	10320	112503	122823	125355	98.0	782.6	2330	13.2	48.3
1987	13607	123201	136808	137414	99.6	901.6	2453	15.1	50.2
1988	12707	126152	138859	137891	100.7	806.1	1794	15.8	70.3
1989	8625	102383	111008	137910	80.5	566.6	2032	15.2	50.4
1990	9447	119968	129415	138504	93.4	42.0	2017	224.9	59.5
1991	10854	112162	123016	125043	98.4	802.7	2346	13.5	47.8

Table 15. Lake trout/backcross harvest and quota for management area 4-5.

Year	Harvest (kgs)			Quota (kgs)	Percent Taken
	Gill	Trap	Total		
1979	20086	6614	26700	N/A	N/A
1980	23412	5978	29390	N/A	N/A
1981	22675	4563	27238	N/A	N/A
1982	14837	3598	18435	N/A	N/A
1983	49371	5127	54498	N/A	N/A
1984	21431	5686	27117	37234	72.8
1985	19023	1212	20235	37209	54.4
1986	28718	1006	29724	37211	79.9
1987	26766	3063	29829	37240	80.1
1988	16701	1255	17956	37240	48.2
1989	14012	1122	15134	34062	44.4
1990	10523	1462	11985	36908	32.5
1991	14172	564	14736	37096	39.7

Table 16. Lake whitefish harvest, quota, effort and CUE for management area 4-7.

Year	Harvest (kgs)	Quota (kgs)	Percent Taken	Effort (km)	CUE (kgs/km)
1979	11177	N/A	N/A	447.8	22.1
1980	27074	N/A	N/A	346.0	75.0
1981	35103	N/A	N/A	381.6	87.9
1982	19962	N/A	N/A	243.5	80.6
1983	34738	N/A	N/A	410.6	78.4
1984	26542	76401	26.5	240.7	85.4
1985	48705	76401	63.7	259.1	156.1
1986	49133	76401	64.3	274.0	175.4
1987	76638	74038	103.5	727.9	105.3
1988	36614	68816	53.2	219.0	167.2
1989	59893	67909	88.2	312.4	191.7
1990	71889	73518	97.8	312.0	230.4
1991	86994	95084	91.5	392.7	221.5

Table 17. Chub harvest, quota, effort and CUE for management area 4-7.

Year	Harvest (kgs)	Quota (kgs)	Percent Taken	Effort (km)	CUE (kgs/km)	
					Harvest	Discards
1979	4918	N/A	N/A	108.5	41.3	
1980	8249	N/A	N/A	322.9	25.2	
1981	16486	N/A	N/A	310.6	50.9	
1982	7543	N/A	N/A	152.5	49.4	
1983	5457	N/A	N/A	116.8	45.4	
1984	42954	38946	110.3	556.2	78.3	
1985	33275	44788	74.3	435.4	67.5	
1986	32145	54092	59.4	394.1	81.6	9.2
1987	39352	53967	72.9	591.0	66.5	5.8
1988	41537	53764	77.3	480.9	86.4	6.4
1989	49596	53764	92.2	512.5	96.8	10.7
1990	23691	55463	42.7	269.6	87.9	no data
1991	26283	59141	44.4	288.4	91.1	56.4

Table 18. Lake whitefish harvest, quota, effort and CUE for management area 5-1.

Year	Harvest (kgs)	Quota (Kgs)	Percent Taken	Effort (km)	CUE (kgs/km)
1979	13362	N/A	N/A	545.5	24.3
1980	24536	N/A	N/A	417.6	28.6
1981	15061	N/A	N/A	173.3	28.7
1982	7679	N/A	N/A	183.5	11.4
1983	6517	N/A	N/A	462.5	9.9
1984	9593	49037	19.6	193.7	44.8
1985	17974	49037	36.7	363.0	49.7
1986	28899	49037	58.9	448.2	63.8
1987	11944	41836	28.5	393.8	29.8
1988	8717	42114	20.7	594.0	14.4
1989	7370	35509	20.8	121.9	60.5
1990	7461	33722	22.1	105.1	71.0
1991	19056	28741	66.3	357.0	53.4

Table 19. Chub harvest, quota, effort and CUE for management area 5-1.

Year	Harvest (kgs)	Quota (kgs)	Percent Taken	Effort (km)	CUE (kgs/km)
1979	7096	N/A	N/A	211.6	33.8
1980	914	N/A	N/A	108.3	8.4
1981	980	N/A	N/A	33.0	29.9
1982	3555	N/A	N/A	121.6	28.3
1983	1464	N/A	N/A	60.9	21.1
1984	4529	18004	25.2	139.8	31.6
1985	4697	20704	22.7	48.1	98.3
1986	12490	17553	71.2	285.8	44.0
1987	9290	17468	53.2	243.2	37.7
1988	6166	17599	35.0	226.1	27.3
1989	3799	17052	22.3	14.8	256.7
1990	752	17052	4.4	7.3	102.8
1991	9094	13654	66.6	144.4	63.0

Table 20. Yellow perch harvest, quota, effort and CUE for management area 5-1.

Year	Harvest (kgs)	Quota (kgs)	Percent Taken	Effort (km)	CUE (kgs/km)
1979	15888	N/A	N/A	792.8	20.0
1980	15970	N/A	N/A	510.4	24.1
1981	14809	N/A	N/A	503.4	23.7
1982	6727	N/A	N/A	335.5	18.2
1983	16126	N/A	N/A	774.2	20.5
1984	14714	28783	51.1	557.0	28.4
1985	11601	28783	40.3	227.9	50.3
1986	8510	30824	27.6	358.7	23.4
1987	6789	29788	22.8	330.6	20.4
1988	6994	29869	23.4	571.7	12.2
1989	1907	25801	7.4	104.4	18.3
1990	1305	24983	5.2	36.1	36.1
1991	1427	18938	7.5	63.1	22.6

Table 21. Lake trout/backcross harvest and quota for management area 5-1.

Year	Harvest (kgs)	Quota (kgs)	Percent Taken
1979	412	N/A	N/A
1980	3546	N/A	N/A
1981	850	N/A	N/A
1982	900	N/A	N/A
1983	271	N/A	N/A
1984	822	1588	51.8
1985	2286	1588	144.0
1986	2591	2672	97.0
1987	1187	2562	46.3
1988	1387	2562	54.1
1989	845	2596	32.6
1990	1180	2482	47.5
1991	1187	2596	45.7

Table 22. Lake whitefish harvest, quota, effort and CUE for management area 5-2.

Year	Harvest (kgs)	Quota (kgs)	Percent Taken	Effort (km)	CUE (kgs/km)
1979	17267	N/A	N/A	764.3	22.5
1980	8428	N/A	N/A	620.0	13.5
1981	7343	N/A	N/A	280.5	25.6
1982	6732	N/A	N/A	92.7	71.4
1983	6360	N/A	N/A	157.7	40.2
1984	9488	22612	42.0	154.4	61.4
1985	7239	22612	32.0	201.8	34.7
1986	2532	21354	11.9	69.5	37.5
1987	2507	21398	11.7	74.7	31.4
1988	2108	21398	9.9	21.9	94.0
1989	1683	19258	8.7	33.2	51.3
1990	2553	18901	13.5	31.0	82.2
1991	12278	31550	38.9	90.0	137.9

Table 23. Chub harvest, quota, effort and CUE for management area 5-2.

Year	Harvest (kgs)	Quota (kgs)	Percent Taken	Effort (km)	CUE (kgs/km)
1979	10228	N/A	N/A	313.8	31.5
1980	3502	N/A	N/A	56.6	29.2
1981	14	N/A	N/A	3.7	3.8
1982	1	N/A	N/A	2.7	0.0
1983	0	N/A	N/A	0.0	0.0
1984	8583	17270	49.7	59.5	141.9
1985	11838	20120	58.8	90.8	101.8
1986	10754	17270	62.3	159.9	67.5
1987	8139	19841	41.0	123.7	65.8
1988	7260	20163	36.0	124.4	58.4
1989	109	20163	0.5	2.7	40.4
1990	92	20001	0.5	1.5	62.9
1991	3095	20000	15.5	37.7	82.1

Table 24. Yellow perch harvest, quota, effort and CUE for management area 5-2.

Year	Harvest (kgs)	Quota (kgs)	Percent Taken	Effort (km)	CUE (kgs/km)
1979	287	N/A	N/A	4.7	47.0
1980	0	N/A	N/A	0.0	0.0
1981	0	N/A	N/A	0.0	0.0
1982	22	N/A	N/A	2.7	8.1
1983	212	N/A	N/A	0.0	0.0
1984	179	907	19.7	12.3	14.5
1985	477	1043	45.7	14.2	31.1
1986	112	1043	10.7	15.0	5.1
1987	845	1132	74.6	38.9	20.3
1988	484	1244	38.9	7.1	68.2
1989	1	1244	0.1	0.0	0.0
1990	10	1244	0.8	0.5	18.2
1991	79	1730	4.6	3.3	23.9

Table 25. Walleye harvest, quota and CUE for management area 5-2.

Year	Harvest (kgs)	Quota (kgs)	Percent Taken	CUE (kgs/km)
1979	7253	N/A	N/A	17.9
1980	7727	N/A	N/A	19.7
1981	5942	N/A	N/A	24.8
1982	5837	N/A	N/A	43.6
1983	6671	N/A	N/A	28.1
1984	3443	5002	68.8	24.8
1985	1878	5002	37.5	17.8
1986	1981	4551	43.5	25.4
1987	2014	4561	44.2	21.8
1988	2144	4591	46.7	50.9
1989	1940	4591	42.3	21.3
1990	1133	4568	24.8	46.6
1991	2606	6192	42.1	35.6

Table 26. Lake whitefish harvest, quota, effort and CUE for management area 5-3.

Year	Harvest (kgs)				Quota (kgs)	Percent Taken	Gill Effort (km)			CUE (kgs/km)	
	GB03	GB04	GB06	Total			GB03	GB06	Total	GB03	GB06
1979	5903	0	0	5903	N/A	N/A	47.1	0.0	47.1	55.3	0.0
1980	6938	0	4264	11202	N/A	N/A	65.7	40.6	106.3	77.7	105.0
1981	5307	0	765	6072	N/A	N/A	71.9	50.1	122.0	64.4	15.3
1982	6627	109	1952	8688	N/A	N/A	70.6	124.7	195.3	92.1	14.9
1983	2679	0	263	2942	N/A	N/A	41.8	10.2	52.0	64.1	25.8
1984	9026	0	324	9350	30120	31.0	71.6	8.9	80.5	121.8	36.4
1985	29541	10	2815	32366	30120	107.5	380.1	44.0	424.1	77.7	64.0
1986	23729	0	2700	26429	31881	82.9	253.1	67.7	320.8	86.8	39.5
1987	15916	107	1192	17215	39946	43.1	202.6	32.1	234.7	78.6	37.1
1988	5800	1	2368	8169	40197	20.3	179.9	18.1	198.0	32.2	130.8
1989	6872	0	2125	8997	36508	24.6	38.5	19.5	58.0	178.5	109.0
1990	10981	45	2127	13153	35440	37.1	69.9	17.3	87.2	157.2	123.1
1991	10311	0	2176	12487	36066	34.6	84.1	15.9	100.0	122.6	136.9

Table 27. Chub harvest, quota, effort and CUE for management area 5-3.

Year	Harvest (kgs)				Quota (kgs)	Percent Taken	Gill Effort (km)				Gill CUE (kgs/km)		
	GB03	GB04	GB06	Total			GB03	GB04	GB06	Total	GB03	GB04	GB06
											Harvest	Discard	
1979	37874	23955	10321	72150	N/A	N/A	717.4	397.4	305.1	1419.9	52.8	60.3	33.8
1980	25546	19159	11475	56180	N/A	N/A	1008.6	463.4	356.3	1828.3	25.3	41.3	32.2
1981	18811	18427	10979	48217	N/A	N/A	513.1	411.8	352.3	1277.2	36.7	44.7	31.2
1982	22284	5604	17227	45115	N/A	N/A	492.2	170.7	636.6	1299.5	45.3	32.8	27.1
1983	36101	17283	45477	98861	N/A	N/A	691.6	426.1	1356.8	2474.5	52.2	40.6	33.5
1984	50760	19340	60016	130116	182268	71.4	608.1	173.0	589.5	1370.6	83.4	111.8	101.8
1985	68764	11704	84901	165369	182268	90.7	802.4	83.4	797.4	1683.2	85.7	140.3	106.5
1986	47239	18150	64399	129788	182268	71.2	740.7	185.2	765.2	1691.1	63.8	12.2	98.0
1987	36063	20662	45287	102012	185787	54.9	542.0	172.6	691.3	1405.9	66.5	8.8	119.7
1988	53956	31826	67785	153567	185787	82.7	783.7	331.8	1093.4	2208.9	68.8	5.3	95.9
1989	66617	9665	73453	149735	185787	80.6	665.8	109.8	997.8	1773.4	100.1	9.2	88.0
1990	56829	5755	60718	123302	198722	62.0	707.5	54.9	791.4	1553.8	80.3	53.8	104.9
1991	49187	4324	56743	110254	204286	54.0	466.5	45.8	1054.5	1566.8	105.4	22.0	94.4

Table 28. Yellow perch harvest and quota for management area 5-3.

Year	Harvest (kgs)	Quota (kgs)	Percent Taken
1979	1071	N/A	N/A
1980	489	N/A	N/A
1981	128	N/A	N/A
1982	337	N/A	N/A
1983	207	N/A	N/A
1984	433	4100	10.6
1985	193	4100	4.7
1986	52	4100	1.3
1987	1000	3899	25.6
1988	88	3899	2.3
1989	71	4554	1.6
1990	112	4423	2.5
1991	79	4525	1.7

Table 29. Lake trout/backcross harvest, quota and CUE for management area 5-3.

Year	Harvest (kgs)				Quota (kgs)	Percent Taken	CUE (kgs/km)	
	GB03	GB04	GB06	Total			GB03	GB06
1979	13	0	0	13	N/A	N/A	2.4	0.0
1980	298	0	2792	3090	N/A	N/A	3.3	70.7
1981	82	0	1600	1682	N/A	N/A	1.6	30.0
1982	0	0	0	0	N/A	N/A	0.0	0.0
1983	6	0	0	6	N/A	N/A	0.9	0.0
1984	0	0	0	0	4377	0.0	0.0	0.0
1985	252	0	1566	1818	4377	41.5	18.7	39.7
1986	1545	0	1520	3065	5044	60.8	15.3	24.9
1987	1332	0	1194	2526	2786	90.7	13.6	27.8
1988	525	0	1015	1540	2786	55.3	11.9	55.8
1989	42	0	568	610	2820	21.6	10.5	51.2
1990	137	0	292	429	2706	15.9	3.9	22.2
1991	226	0	1078	1304	2820	46.2	5.5	67.8

Table 30. Lake whitefish harvest, quota, effort and CUE for management area 5-4.

Year	Harvest (kgs)	Quota (kgs)	Percent Taken	Effort (km)	CUE (kgs/km)
1979	2781	N/A	N/A	48.2	57.4
1980	2305	N/A	N/A	92.7	23.3
1981	2718	N/A	N/A	75.7	33.9
1982	4090	N/A	N/A	83.8	45.1
1983	1293	N/A	N/A	58.6	20.6
1984	291	5733	5.1	4.5	59.3
1985	587	5733	10.2	3.8	155.3
1986	714	5958	12.0	16.4	43.7
1987	3415	7225	47.3	50.3	67.9
1988	1303	7273	17.9	30.2	42.0
1989	2997	7220	41.5	36.5	82.1
1990	2019	6544	30.9	21.0	96.2
1991	4220	6538	64.5	56.3	75.0

Table 31. Chub harvest, quota, effort and CUE for management area 5-4.

Year	Harvest (kgs)	Quota (kgs)	Percent Taken	Effort (km)	CUE (kgs/km)
1979	25615	N/A	N/A	621.5	41.5
1980	16301	N/A	N/A	405.6	40.2
1981	0	N/A	N/A	0.0	0.0
1982	444	N/A	N/A	9.3	41.3
1983	900	N/A	N/A	71.7	12.6
1984	4746	13518	35.1	24.0	199.0
1985	5835	15546	37.5	47.6	85.6
1986	2901	13518	21.5	47.7	61.2
1987	5252	17884	29.4	68.3	76.9
1988	9368	18000	52.0	169.2	55.4
1989	779	18000	4.3	5.6	139.1
1990	169	18000	0.9	3.6	47.4
1991	3140	18000	17.4	36.5	86.0

Table 32. Yellow perch harvest, quota, effort and CUE for management area 5-4.

Year	Harvest (kgs)	Quota (kgs)	Percent Taken	Effort (km)	CUE (kgs/km)
1979	6186	N/A	N/A	122.2	49.7
1980	6126	N/A	N/A	102.2	58.7
1981	8522	N/A	N/A	140.6	60.6
1982	8528	N/A	N/A	256.3	33.1
1983	4979	N/A	N/A	188.5	26.0
1984	4883	4767	102.4	66.1	73.9
1985	504	4767	10.6	11.9	42.4
1986	1476	4790	30.8	35.0	42.2
1987	2317	5230	44.3	46.9	49.4
1988	2268	5706	39.7	35.5	63.9
1989	682	5706	12.0	15.0	45.5
1990	1277	5706	22.4	17.8	71.6
1991	546	5706	9.6	16.9	32.3

Table 33. Lake whitefish harvest, quota, effort and CUE for management area 5-5.

Year	Harvest (kgs)	Quota (kgs)	Percent Taken	Effort (km)	CUE (kgs/km)
1979	2590	N/A	N/A	54.4	45.3
1980	1123	N/A	N/A	36.6	28.5
1981	1283	N/A	N/A	23.8	53.7
1982	3225	N/A	N/A	75.7	41.6
1983	5490	N/A	N/A	94.9	53.8
1984	4323	6759	64.0	39.3	109.4
1985	6162	6759	91.2	60.3	98.2
1986	9613	8111	118.5	95.6	101.0
1987	7595	10731	70.8	106.4	71.1
1988	3961	12620	31.4	55.7	70.5
1989	3900	11766	33.1	51.2	36.7
1990	5103	11353	44.9	54.1	94.3
1991	5914	11353	52.1	99.8	59.3

Table 34. Chub harvest, quota, effort and CUE for management area 5-5.

Year	Harvest (kgs)	Quota (kgs)	Percent Taken	Effort (km)	CUE (kgs/km)
1979	8867	N/A	N/A	161.2	55.0
1980	4560	N/A	N/A	106.9	41.8
1981	1087	N/A	N/A	16.3	62.4
1982	2087	N/A	N/A	26.7	78.7
1983	14942	N/A	N/A	141.5	91.7
1984	13504	11265	119.9	134.2	101.4
1985	15063	12955	116.3	171.6	88.4
1986	10787	18925	57.0	152.2	66.5
1987	18396	31280	58.8	394.5	46.6
1988	25945	31488	82.4	399.7	64.9
1989	23767	31488	75.5	251.7	94.4
1990	5980	34364	17.4	89.9	66.5
1991	19481	34364	56.7	280.9	69.4

Table 35. Yellow perch harvest, quota, effort and CUE for management area 5-5.

Year	Harvest (kgs)	Quota (kgs)	Percent Taken	Effort (km)	CUE (kgs/km)
1979	11938	N/A	N/A	116.7	102.3
1980	9741	N/A	N/A	122.0	77.7
1981	8117	N/A	N/A	110.7	73.1
1982	4957	N/A	N/A	111.9	43.2
1983	8108	N/A	N/A	297.6	27.2
1984	8263	6804	121.4	127.5	64.8
1985	3991	6804	58.7	94.7	42.1
1986	4868	11794	41.3	94.0	51.8
1987	7332	12500	58.7	141.1	52.0
1988	12035	13182	91.3	180.0	66.9
1989	4840	13182	36.7	89.8	53.9
1990	4078	13128	31.1	56.1	72.6
1991	2162	13128	16.5	65.1	33.2

Table 36. Lake whitefish harvest and quota for management area 5-6.

Year	Harvest (kgs)	Quota (kgs)	Percent Taken
1979	0	N/A	N/A
1980	205	N/A	N/A
1981	415	N/A	N/A
1982	5836	N/A	N/A
1983	8450	N/A	N/A
1984	73	7480	1.0
1985	4283	7480	57.3
1986	8137	12211	66.6
1987	9060	16246	55.8
1988	3691	16354	22.6
1989	6572	16354	40.2
1990	1981	16308	12.1
1991	155	408	38.0

Table 37. Chub harvest, quota, effort and CUE for management area 5-6.

Year	Harvest (kgs)	Quota (kgs)	Percent Taken	Effort (km)	CUE (kgs/km)	
					Harvest	Discards
1979	4708	N/A	N/A	155.2	28.1	
1980	3554	N/A	N/A	101.5	28.2	
1981	3662	N/A	N/A	69.0	44.3	
1982	10591	N/A	N/A	211.5	44.5	
1983	13582	N/A	N/A	159.4	54.6	
1984	27978	28748	97.3	303.7	91.2	
1985	34135	42077	81.1	325.5	103.4	
1986	29373	49822	59.0	342.5	84.0	2.7
1987	27263	54941	49.6	344.8	79.1	3.6
1988	40844	55307	73.8	477.3	85.6	no data
1989	41194	55307	74.5	376.2	109.5	7.5
1990	43668	60820	71.8	352.1	124.0	6.9
1991	40664	46070	88.3	419.0	97.1	9.8

Table 38. Lake trout/backcross harvest and quota for management area 5-6.

Year	Harvest (kgs)	Quota (kgs)	Percent Taken
1979	0	N/A	N/A
1980	0	N/A	N/A
1981	0	N/A	N/A
1982	0	N/A	N/A
1983	0	N/A	N/A
1984	0	2268	0.0
1985	7270	2268	320.5
1986	1717	2279	75.3
1987	3508	4558	77.0
1988	11923	4558	261.6
1989	4820	4558	105.7
1990	3373	4558	74.0
1991	12	0	0

Table 39. Lake whitefish harvest, quota, effort and CUE for management area 5-7.

Year	Harvest (kgs)	Quota (kgs)	Percent Taken	Effort (km)	CUE (kgs/km)
1979	17043	N/A	N/A	99.4	169.6
1980	20873	N/A	N/A	370.5	54.4
1981	9490	N/A	N/A	125.8	75.2
1982	12241	N/A	N/A	433.8	25.5
1983	3039	N/A	N/A	130.4	22.0
1984	5649	13878	40.7	115.8	48.9
1985	8337	13878	60.1	181.3	46.3
1986	16783	20998	79.9	182.6	92.5
1987	9275	21021	44.1	142.8	64.9
1988	4431	24248	18.3	102.2	42.9
1989	6572	24338	27.0	100.7	65.2
1990	6446	14346	44.9	90.0	71.6
1991	5828	14618	39.9	33.6	173.5

Table 40. Chub harvest, quota, effort and CUE for management area 5-7.

Year	Harvest (kgs)	Quota (kgs)	Percent Taken	Effort (km)	CUE (kgs/km)
1979	7452	N/A	N/A	194.2	38.6
1980	2742	N/A	N/A	55.5	39.5
1981	0	N/A	N/A	0.0	0.0
1982	0	N/A	N/A	0.0	0.0
1983	5204	N/A	N/A	44.5	70.2
1984	6668	8111	82.2	78.2	85.8
1985	9072	11918	76.1	102.4	89.2
1986	4411	10364	42.6	60.5	68.5
1987	8253	10471	78.8	137.4	60.1
1988	10492	11441	91.7	108.6	96.6
1989	9870	10538	93.7	76.1	129.7
1990	11167	11592	96.3	97.4	114.7
1991	10102	11592	87.1	85.2	118.6

Table 41. Yellow perch harvest and quota for management area 5-7.

Year	Harvest (kgs)	Quota (kgs)	Percent Taken	Effort (km)	CUE (kgs/km)
1979	4330	N/A	N/A	37.2	115.3
1980	1857	N/A	N/A	6.4	162.2
1981	371	N/A	N/A	3.1	119.0
1982	3613	N/A	N/A	5.2	186.5
1983	9454	N/A	N/A	154.2	61.0
1984	597	4672	12.8	5.6	75.4
1985	2081	4672	44.5	21.6	81.2
1986	7258	7031	103.2	97.4	72.6
1987	5504	10542	52.2	104.0	51.7
1988	6147	11211	54.8	97.1	56.6
1989	1693	11226	15.1	23.0	44.0
1990	4194	8729	48.0	65.7	63.9
1991	2228	8729	25.5	32.6	68.3

Table 42. Lake whitefish harvest, quota, effort and CUE for management area 5-8.

Year	Harvest (kgs)	Quota (kgs)	Percent Taken	Effort (km)	CUE (kgs/km)
1979	1368	N/A	N/A	31.6	34.4
1980	10539	N/A	N/A	553.9	18.4
1981	7256	N/A	N/A	311.8	21.8
1982	11726	N/A	N/A	310.6	36.9
1983	12070	N/A	N/A	310.2	34.9
1984	898	13518	6.6	20.6	37.1
1985	3926	3605	108.9	27.2	137.9
1986	4560	3605	126.5	20.9	210.0
1987	3344	9012	37.1	30.2	108.9
1988	3468	9072	38.2	37.7	91.2
1989	4114	9072	45.3	27.1	151.7
1990	8239	9072	90.8	39.5	208.4
1991	9617	9979	96.4	44.9	214.2

Table 43. Chub harvest, quota, effort and CUE for management area 5-8.

Year	Harvest (kgs)	Quota (kgs)	Percent Taken	Effort (km)	CUE (kgs/km)
1979	17230	N/A	N/A	480.8	31.4
1980	4159	N/A	N/A	102.5	29.8
1981	2371	N/A	N/A	56.5	34.3
1982	7651	N/A	N/A	67.4	51.7
1983	25413	N/A	N/A	174.0	90.4
1984	22639	13518	167.5	289.4	74.0
1985	22546	25339	89.0	281.9	80.5
1986	16711	23071	72.4	246.9	68.1
1987	13786	16447	83.8	268.7	50.5
1988	16339	16533	98.8	172.8	94.5
1989	22366	16533	135.3	159.6	140.1
1990	16968	18186	93.3	157.1	108.0
1991	17905	18168	98.6	214.1	83.6

Table 44. Lake trout/backcross harvest, quota, effort and CUE for management area 5-8.

Year	Harvest (kgs)	Quota (kgs)	Percent Taken	Effort (km)	CUE (kgs/km)
1979	745	N/A	N/A	26.6	11.7
1980	30074	N/A	N/A	565.7	52.7
1981	23474	N/A	N/A	343.5	68.1
1982	21238	N/A	N/A	0.0	0.0
1983	17798	N/A	N/A	1.1	108.2
1984	2225	2268	98.1	0.0	0.0
1985	4220	4536	93.0	30.3	130.9
1986	3945	4536	87.0	20.9	164.2
1987	4374	4536	96.4	30.2	143.8
1988	4032	4536	88.9	37.7	102.3
1989	4584	4536	101.1	27.1	169.1
1990	4470	4536	98.5	36.3	123.3
1991	5456	4536	120.3	44.9	121.5

Table 45. Lake whitefish harvest, quota, effort and CUE for management area 5-9.

Year	Harvest (kgs)	Quota (kgs)	Percent Taken	Effort (km)	CUE (kgs/km)
1979	10438	N/A	N/A	245.7	42.7
1980	20318	N/A	N/A	665.2	30.6
1981	46181	N/A	N/A	585.8	79.1
1982	25554	N/A	N/A	644.4	36.6
1983	28233	N/A	N/A	634.4	38.9
1984	26863	26811	100.2	239.6	112.8
1985	33472	33565	99.7	128.8	261.5
1986	33112	40361	82.0	152.4	218.6
1987	19239	40441	47.6	151.4	127.1
1988	19457	40710	47.8	148.3	131.2
1989	18663	38460	48.5	136.6	136.6
1990	19937	40710	49.0	118.4	168.4
1991	38541	44590	86.4	164.3	234.6

Table 46. Chub harvest, quota, effort and CUE for management area 5-9.

Year	Harvest (kgs)	Quota (kgs)	Percent Taken	Effort (km)	CUE (kgs/km)
1979	666	N/A	N/A	36.6	18.0
1980	115	N/A	N/A	9.7	11.9
1981	23	N/A	N/A	1.8	12.2
1982	0	N/A	N/A	0.0	0.0
1983	7001	N/A	N/A	82.5	29.1
1984	3135	3154	99.4	51.7	61.0
1985	2839	3627	78.3	38.4	74.4
1986	5596	6849	81.7	84.7	66.5
1987	2419	6736	35.9	58.4	41.2
1988	7058	6780	104.1	92.8	75.9
1989	11171	11303	98.8	85.1	131.2
1990	9991	9958	100.3	68.6	145.6
1991	7164	9958	71.9	61.1	117.2

Table 47. Lake trout/backcross harvest, quota, effort and CUE for management area 5-9.

Year	Harvest (kgs)	Quota (kgs)	Percent Taken	Effort (km)	CUE (kgs/km)
1979	0	N/A	N/A	70.0	1.7
1980	175	N/A	N/A	422.4	11.9
1981	0	N/A	N/A	331.2	39.2
1982	19	N/A	N/A	0.7	27.1
1983	0	N/A	N/A	0.0	0.0
1984	4	4037	0.1	3.2	1.3
1985	4000	4037	99.1	117.8	33.6
1986	4627	4930	93.9	130.2	35.5
1987	3090	4937	62.6	128.5	23.9
1988	4909	4937	99.4	124.1	39.5
1989	4574	4937	92.6	105.4	43.4
1990	4818	4937	97.6	79.6	60.6
1991	4729	4927	96.0	119.2	39.7

Table 48. Lake whitefish harvest and quota for management area 6-1.

Year	Gill Net Harvest (kgs)					Trap Net Harvest (kgs)			Harvest Total	Quota (kgs)	Percent Taken
	NC01	NC02	NC03	NC04	Total	NC01	NC02	Total			
1979	7606	55051	3012	269	65938	0	0	0	65938	N/A	N/A
1980	2735	70622	2268	1444	77069	0	355	355	77424	N/A	N/A
1981	7613	84974	8137	95	100819	0	495	495	101314	N/A	N/A
1982	14988	152327	7914	3639	178868	0	520	520	179388	N/A	N/A
1983	26070	175116	11317	2769	215272	0	0	0	215272	N/A	N/A
1984	35782	123298	20585	4188	183853	0	100	100	183953	243345	75.6
1985	22957	129839	19020	8689	180505	0	1797	1797	182302	271566	67.1
1986	24280	137953	10634	3396	176263	2258	501	2759	179022	242779	73.7
1987	8924	146310	18104	2265	175603	8113	21489	29602	205205	244031	84.1
1988	17297	124432	9414	4676	155819	5002	23427	28429	184248	244031	75.5
1989	52116	69799	6096	2591	130602	1952	8387	10339	140941	243151	58.0
1990	37589	73938	13682	2956	128165	1134	6551	7685	135850	217577	62.4
1991	18175	112283	21666	3862	155986	0	11654	11654	167640	216576	77.4

Table 49. Lake whitefish effort and CUE for management area 6-1.

Year	Gill Net Effort (km)					Trap Effort (# nets)			Gill CUE (kg/km)				Trap CUE kg/net	
	NC01	NC02	NC03	NC04	Total	NC01	NC02	Total	NC01	NC02	NC03	NC04	NC01	NC02
1979	318.6	1764.7	146.9	9.9	2240.1	0	0	0	23.9	31.2	20.5	26.8	0.0	0.0
1980	105.5	1801.5	121.6	74.3	2102.9	0	7	0	25.9	39.2	18.7	19.2	0.0	50.7
1981	178.5	1610.5	343.1	10.5	2142.6	0	13	0	42.6	52.8	23.7	8.9	0.0	38.1
1982	302.4	2199.5	215.0	83.2	2800.1	0	9	9	49.6	69.3	36.8	37.0	0.0	57.8
1983	344.6	2544.6	284.5	36.2	3209.9	0	0	0	75.7	68.8	39.8	71.7	0.0	0.0
1984	347.7	2173.7	413.3	45.7	2980.4	0	2	2	102.9	56.7	49.8	82.0	0.0	50.0
1985	336.0	2522.9	367.7	132.3	3358.9	0	24	24	68.3	51.5	51.7	64.7	0.0	74.9
1986	463.3	2699.0	291.5	39.5	3493.3	17	4	21	52.4	51.1	36.5	82.3	132.8	125.3
1987	230.8	2328.3	338.7	47.7	2945.5	58	138	196	38.7	62.8	53.5	44.5	139.9	155.7
1988	414.9	2218.7	213.2	59.4	2906.2	61	198	259	41.7	56.0	44.2	56.8	82.0	118.3
1989	1139.1	1691.4	217.7	58.3	3106.5	23	103	126	45.8	41.3	28.0	43.9	84.9	81.4
1990	909.9	1689.4	413.5	81.2	3094.0	27	146	173	41.3	43.8	33.1	36.4	42.0	44.9
1991	385.7	1847.5	360.1	55.7	2649.0	0	114	114	47.1	60.8	60.2	69.4	0.0	102.2

Table 50. Yellow perch harvest and quota for management area 6-1.

Year	Gill Net Harvest (kgs)					Trap Net Harvest (kgs)			Harvest Total	Quota (kgs)	Percent Taken
	NC01	NC02	NC03	NC04	Total	NC03	NC04	Total			
1979	617	4858	11890	7653	25018	0	0	0	25018	N/A	N/A
1980	29	842	2818	1170	4859	0	0	0	4859	N/A	N/A
1981	77	7396	33224	4492	45189	5	0	5	45194	N/A	N/A
1982	3	5223	18638	8582	32446	0	0	0	32446	N/A	N/A
1983	0	11003	9911	9406	23683	0	0	0	23683	N/A	N/A
1984	67	9221	25843	12988	48119	0	0	0	48119	71798	67.0
1985	0	6993	22791	10043	39827	0	0	0	39827	80299	49.6
1986	118	3532	12490	7659	23799	2	0	2	23801	75170	31.7
1987	0	4292	18656	10547	33495	0	0	0	33495	75284	44.5
1988	417	8247	31942	11737	52343	0	0	0	52343	82069	63.8
1989	1195	4944	23884	8889	38912	234	843	1077	39989	81381	47.8
1990	863	7814	26296	7123	42096	262	50	312	42408	72916	57.7
1991	1309	5614	33160	10262	50345	10	246	256	50601	67418	75.1

Table 51. Yellow perch effort and CUE for management area 6-1.

Year	Gill Net Effort (km)					Trap Effort (# nets)			Gill CUE (kg/km)				Trap CUE kg/net	
	NC01	NC02	NC03	NC04	Total	NC03	NC04	Total	NC01	NC02	NC03	NC04	NC03	NC04
1979	19.3	97.3	187.9	91.3	395.8	0	0	0	32.0	49.9	63.3	83.8	0.0	0.0
1980	1.6	8.6	32.0	14.1	56.3	0	0	0	18.1	97.9	88.1	80.6	0.0	0.0
1981	1.3	135.9	458.8	58.7	654.7	2	0	0	59.2	54.4	72.4	76.8	2.6	0.0
1982	3.7	66.9	486.1	58.2	614.9	0	0	0	0.8	78.1	38.3	123.0	0.0	0.0
1983	0.0	215.3	272.9	113.4	601.6	0	0	0	0.0	51.1	36.3	74.2	0.0	0.0
1984	1.3	179.8	538.8	195.9	915.8	0	0	0	51.5	51.3	48.0	66.8	0.0	0.0
1985	0.0	150.5	492.9	98.2	741.6	0	0	0	0.0	46.5	46.2	103.0	0.0	0.0
1986	1.0	142.5	521.3	82.5	747.3	3	0	3	118.0	24.8	24.0	92.9	0.9	0.0
1987	0.0	100.2	487.9	124.1	712.2	0	0	0	0.0	42.8	38.2	85.7	0.0	0.0
1988	7.4	187.0	594.0	76.4	864.8	0	0	0	56.4	44.1	53.8	131.3	0.0	0.0
1989	20.9	187.8	535.0	75.6	819.3	49	39	88	57.2	26.3	44.6	106.4	4.8	21.6
1990	11.1	218.9	499.2	98.0	827.2	142	6	148	78.0	35.7	52.2	72.2	1.8	8.3
1991	28.3	182.8	920.6	162.4	1294.1	10	27	37	46.2	30.7	36.0	63.2	1.0	9.1

Table 52. Walleye harvest and quota for management area 6-1.

Year	Gill Net Harvest (kgs)					Impoundment Net Harvest (kgs)					Harvest Total	Quota (kgs)	Percent Taken
	NC01	NC02	NC03	NC04	Total	NC01	NC02	NC03	NC04	Total			
1979	8320	3228	8152	---	19700	---	---	---	---	---	19700	N/A	N/A
1980	4464	2023	6744	0	13231	0	0	1866	0	1866	15097	N/A	N/A
1981	14985	1124	3988	4	20101	0	0	2753	0	2753	22854	N/A	N/A
1982	17014	1694	1950	11	20669	0	0	878	0	878	21547	N/A	N/A
1983	5106	2776	2295	29	10206	0	159	608	0	767	10973	N/A	N/A
1984	4659	2340	3636	138	10773	0	0	65	0	65	10838	22002	49.0
1985	12284	2219	2541	314	17358	0	65	0	0	65	17423	22002	78.9
1986	8135	3649	2569	44	14397	9	0	582	0	582	14979	22001	65.4
1987	7143	2449	2246	28	11866	7	619	103	0	722	12588	22227	53.4
1988	5910	1737	4166	18	11831	14	222	0	0	222	12053	22203	54.7
1989	10474	3238	2696	6	16414	0	315	17	0	332	16746	22383	73.3
1990	7943	2002	2529	0	12474	0	60	1047	0	1107	13581	21224	58.8
1991	7638	1897	2635	9	12675	0	63	433	0	496	13171	20069	63.2

Table 53. Walleye effort for management area 6-1.

Year	Gill Net Effort (km)					Impoundment Effort (# nets)				
	NC01	NC02	NC03	NC04	Total	NC01	NC02	NC03	NC04	Total
1979	375.2	242.7	101.2	---	719.1	---	---	---	---	---
1980	88.3	303.8	73.3	0.0	465.4	0	0	77	0	77
1981	329.3	219.3	25.9	5.5	580.0	0	0	177	0	177
1982	452.4	185.7	22.7	0.9	661.7	0	0	79	0	79
1983	172.6	288.3	42.3	0.5	503.7	0	9	57	0	66
1984	153.1	312.4	97.4	6.7	569.6	0	0	21	0	21
1985	367.8	241.8	43.4	1.9	654.9	0	11	0	0	11
1986	334.4	283.6	38.7	3.1	659.8	5	0	74	0	79
1987	268.2	245.6	91.2	1.6	606.6	4	39	36	0	79
1988	262.5	140.7	47.1	1.1	451.4	4	48	0	0	52
1989	502.7	387.7	31.2	5.5	927.1	0	17	20	0	19
1990	267.9	27.3	23.1	0.0	318.4	0	2	44	0	46
1991	294.1	342.1	183.2	9.6	829.0	0	24	27	0	51

Table 54. Walleye CUE for management area 6-1.

Year	Gill CUE (kgs/km)				Impoundment CUE (kgs/net)			
	NC01	NC02	NC03	NC04	NC01	NC02	NC03	NC04
1979	22.2	12.9	79.7	---	---	---	---	---
1980	50.6	6.4	66.6	0.0	0.0	0.0	24.2	0.0
1981	44.3	4.7	42.3	0.8	0.0	0.0	15.6	0.0
1982	37.6	9.1	41.0	11.7	0.0	0.0	11.1	0.0
1983	29.6	8.5	33.0	49.2	0.0	17.0	10.7	0.0
1984	30.4	7.0	33.2	20.6	0.0	0.0	3.1	0.0
1985	33.4	8.7	48.6	163.0	0.0	5.9	0.0	0.0
1986	24.3	12.2	35.0	14.1	1.9	0.0	7.8	0.0
1987	26.6	7.0	20.1	17.3	1.9	16.0	2.9	0.0
1988	22.5	10.6	62.5	7.4	3.6	4.6	0.0	0.0
1989	20.8	7.3	78.7	1.1	0.0	18.2	8.5	0.0
1990	29.6	71.0	64.1	0.0	0.0	3.0	12.5	0.0
1991	26.0	5.5	14.4	0.9	0.0	2.6	16.0	0.0

Table 55. Lake trout/backcross harvest, quota and CUE for management area 6-1.

Year	Harvest (kgs)					Quota (kgs)	Percent Taken	Gill CUE (kgs/km)			
	NC01	NC02	NC03	NC04	Total			NC01	NC02	NC03	NC04
1979	922	2165	9	26	3122	N/A	N/A	4.7	3.8	0.0	10.0
1980	166	2228	53	20	2467	N/A	N/A	12.3	2.9	5.5	1.0
1981	311	1315	8	7	1641	N/A	N/A	2.7	2.6	0.5	0.0
1982	119	36	0	8	163	N/A	N/A	24.3	2.5	0.0	0.0
1983	10	139	0	14	318	N/A	N/A	0.6	2.0	0.0	0.0
1984	38	98	0	70	206	2743	7.5	2.0	1.2	0.0	0.0
1985	41	504	489	772	1806	2743	65.8	1.6	1.2	3.2	6.6
1986	54	1939	2102	549	4644	5612	82.8	1.4	2.1	5.8	6.9
1987	6	2993	974	332	4305	5397	79.8	0.8	3.8	2.3	3.1
1988	39	2436	892	673	4040	5397	74.9	0.9	3.1	5.4	14.0
1989	450	2548	1618	1219	5835	5395	108.2	1.9	3.3	6.8	18.7
1990	483	2730	2382	1532	7127	7735	92.1	2.3	5.3	5.7	11.7
1991	653	4135	2780	1020	8588	7232	118.8	4.5	3.5	5.8	11.8

Table 56. Northern pike harvest and quota for management area 6-1.

Year	Harvest (kgs)	Quota (kgs)	Percent Taken
1979	---	N/A	N/A
1980	5853	N/A	N/A
1981	12438	N/A	N/A
1982	8736	N/A	N/A
1983	7658	N/A	N/A
1984	8484	19553	43.4
1985	10302	19553	52.7
1986	10000	19025	52.6
1987	6709	19069	35.2
1988	5630	19069	29.5
1989	7641	19410	39.4
1990	6459	18729	34.5
1991	4068	16036	25.4

Table 57. Pink salmon harvest and quota for management area 6-1.

Year	Harvest (kgs)	Quota (kgs)	Percent Taken
1979	1113	N/A	N/A
1980	0	N/A	N/A
1981	7759	N/A	N/A
1982	0	N/A	N/A
1983	31618	N/A	N/A
1984	293	N/A	N/A
1985	13138	131680	10.0
1986	2428	67681	3.6
1987	1296	134386	1.0
1988	656	45241	1.5
1989	5525	73007	7.6
1990	999	25873	3.9
1991	3666	132328	2.8

Table 58. Lake whitefish harvest, quota, effort and CUE for management area 6-3.

Year	Harvest (kgs)	Quota (kgs)	Percent Taken	Effort (km)	CUE (kgs/km)
1979	992	N/A	N/A	36.3	25.8
1980	231	N/A	N/A	32.1	7.1
1981	83	N/A	N/A	15.4	5.4
1982	852	N/A	N/A	82.0	10.4
1983	592	N/A	N/A	54.2	10.6
1984	559	6759	8.3	13.2	39.2
1985	128	6759	1.9	2.8	46.1
1986	274	5910	4.6	6.4	37.5
1987	82	4338	1.9	11.9	6.8
1988	198	4336	4.6	3.2	61.9
1989	849	4855	17.5	1.1	770.9
1990	2507	4774	52.5	14.8	169.1
1991	1146	4774	24.0	3.7	309.7

Table 59. Yellow perch harvest, quota, effort and CUE for management area 6-3.

Year	Harvest (kgs)	Quota (kgs)	Percent Taken	Effort (km)	CUE (kgs/km)
1979	6668	N/A	N/A	55.3	120.9
1980	2826	N/A	N/A	51.2	47.4
1981	5611	N/A	N/A	46.8	81.3
1982	2578	N/A	N/A	47.6	50.7
1983	7758	N/A	N/A	146.0	50.6
1984	6153	12825	48.0	113.9	54.4
1985	113	4324	2.6	36.7	58.7
1986	1376	5450	25.2	44.6	31.1
1987	836	5347	15.6	19.0	44.3
1988	4029	5347	75.4	123.1	32.7
1989	5	1245	0.4	5.5	0.9
1990	0	1245	0.0	0.0	0.0
1991	0	1245	0.0	0.0	0.0

Table 60. Lake trout/backcross harvest, quota and CUE for management area 6-3.

Year	Harvest (kgs)	Quota (kgs)	Percent Taken	CUE (kgs/km)
1979	1529	N/A	N/A	29.8
1980	6066	N/A	N/A	44.1
1981	2055	N/A	N/A	65.2
1982	1073	N/A	N/A	1.0
1983	2041	N/A	N/A	25.7
1984	717	1134	63.2	1.0
1985	487	1134	42.9	150.0
1986	563	1134	49.6	57.1
1987	430	1023	42.0	61.6
1988	2135	1023	208.7	523.0
1989	941	877	107.3	4705.0
1990	553	888	71.4	197.5
1991	362	888	40.8	181.0

APPENDIX 2

Table 1. Standardized year-class index values from assessment netting projects (average year-class strength = 10).

Year Class	Whitefish			Chub					Yellow Perch		
	4-4	4-5	5-8	4-4	4-5	5-3		5-8	4-4	4-5	6-1
						GB03	GB06				
1975			0.3								
1976			0.3					1.3			
1977			12.4	14.3	13.9			3.3			
1978	6.8		4.5	4.5	4.8			3.8			
1979	7.0		1.6	2.9	4.3			3.2	0.2		
1980	9.8		1.1	8.5	6.6			14.0	6.7		
1981	8.8	0.2	0.6	4.5	2.8			4.8	5.2	10.9	
1982	8.3	11.4	14.4	18.1	34.3	2.3		6.2	5.1	6.8	9.2
1983	5.5	1.4	1.8	12.0	13.4	24.5		56.4	25.3	2.6	22.7
1984	4.7	1.3	0.7	20.7	19.2	16.9	18.2	6.0	3.5	1.7	2.6
1985	9.7	4.9	3.5	2.7	6.0	11.2	12.0	2.9	0.4	4.0	2.5
1986	16.3	21.5	4.7	2.6	2.0	4.4	1.7	2.4	13.1	11.5	5.4
1987	22.1	7.9	22.5	2.6	1.3	2.1	3.3	3.6	24.4	13.4	28.1
1988	7.7	18.0	41.1	41.0	11.0	19.8	29.0	19.3	15.7	20.2	6.5
1989	8.6	19.0	33.2	0.8	0.0			3.2	3.2	11.5	6.6
1990	13.9	5.0	26.1						2.1	32.6	1.0

Table 2. Catch-per-unit effort (#/trap) of age 1 walleye at the Tremblay Creek, Lake St. Clair index site (1987-90 values adjusted due to changes in water clarity).

Year	Age 1 CUE
1977	3.12
1978	0.22
1979	0.62
1980	1.08
1981	0.09
1982	4.05
1983	0.01
1984	2.05
1985	1.94
1986	1.97
1987	0.21
1988	0.15
1989	0.09
1990	0.36

Table 3. Lake whitefish CUE-at-age (number per net lift) from cooperative index fishing in management area 6-1, 1990 - 1991 (2" and 2.5" mesh sizes only).

Age	1990	1991
1	0.54	0.42
2	3.49	2.76
3	1.20	0.68

APPENDIX 3

List of commercial fishermen and contractors involved in the onboard commercial catch sampling, 1990.

FISHERMEN:

Carlson Brothers Fisheries
Deeg, John
E & E Carlson Brothers
Edmonstone, Roland Bud
Family Fish Company Limited
Fordham, Lynn
Goodison, Harold and Sons
Hopper Fisheries Limited
Hore, Murray
Huber Fisheries
Ken and Murray Loop Fishery Limited
L & S Fisheries
Lang, Steven Fisheries
Liddle Brothers Fisheries Limited
Meneray Fisheries Limited
Mitchell, Wayne
North Channel Fisheries
Nyman, B & G Fisheries
Nyman Brothers Fisheries
Perks, John
Pilon Fisheries Limited
Purdy Fisheries Limited
Telford, Stanley
Raney, Russell
McLay Marine Enterprises Ltd.
Telford, Stan
The Purvis Brothers Limited
White, Walter
Witty, Willard

CONTRACTORS:

Austin Environmental Services
Walmsely, Terry
Witty, Mark